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Number 4.

OCTOBER, 1902.

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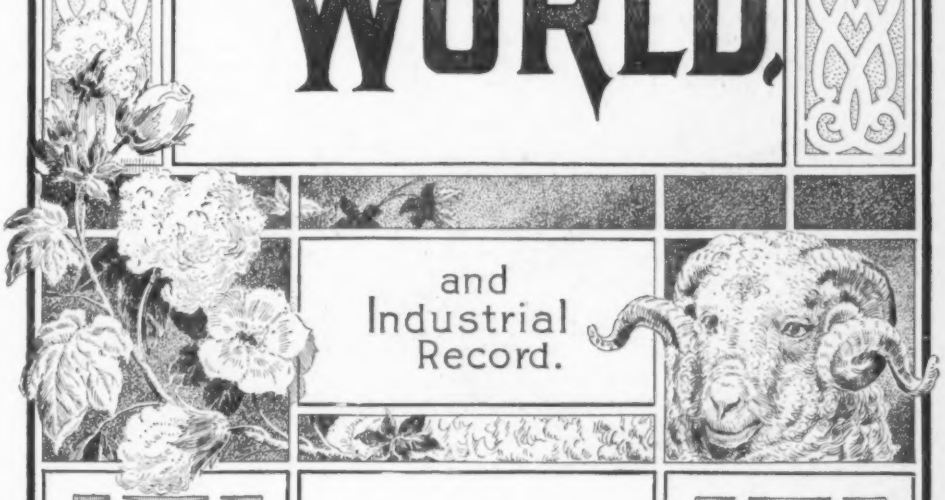

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GUILD & LORD, PUBLISHERS.

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The Report of the Meeting of N. E. Cotton Manufacturers' Association is Contained in this Number.

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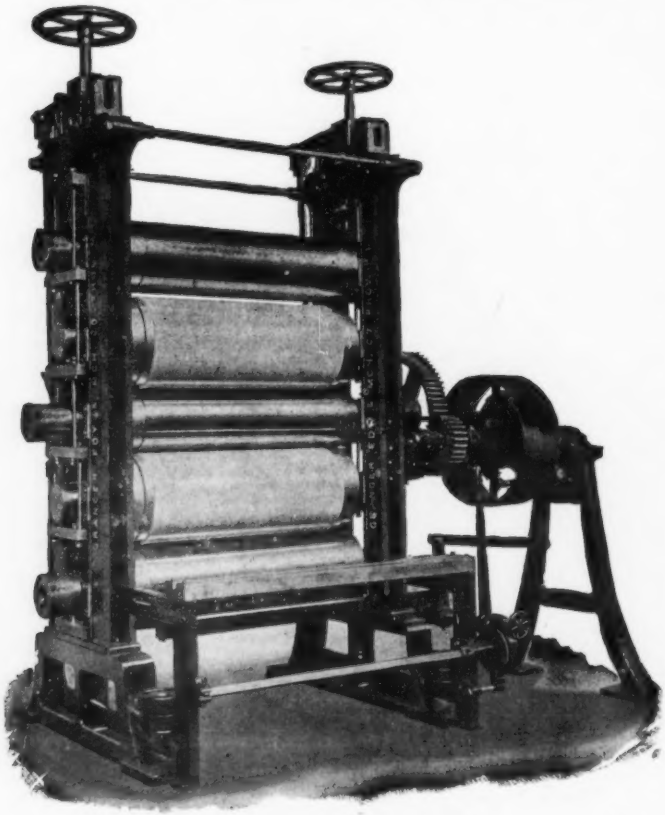
And Finishing Machinery.



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TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

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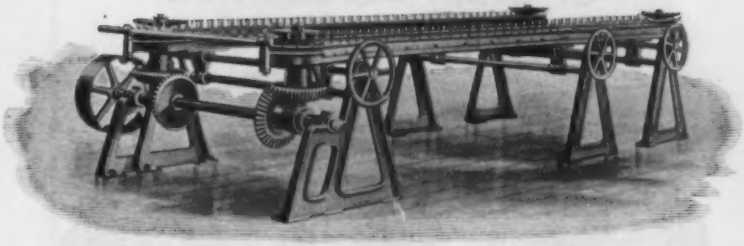

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RETURN (8, 10 or 12) returns FOR WORSTED AND WOOLEN GOODS.

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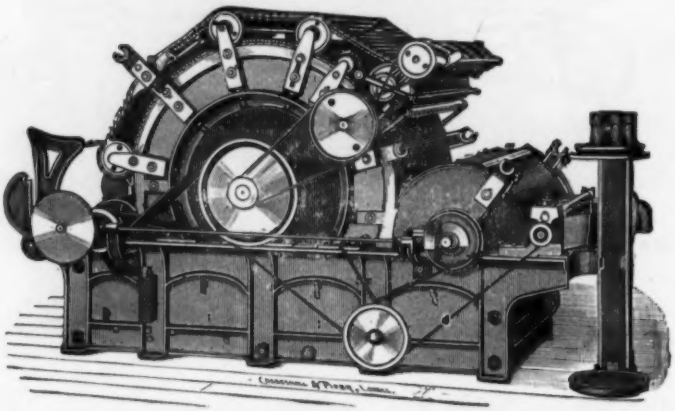

Revolving Flat Cards, Railway Heads,
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Drawing Frames, Spoolers, Warpers,
Slashers, Looms.

Worsted Machinery.

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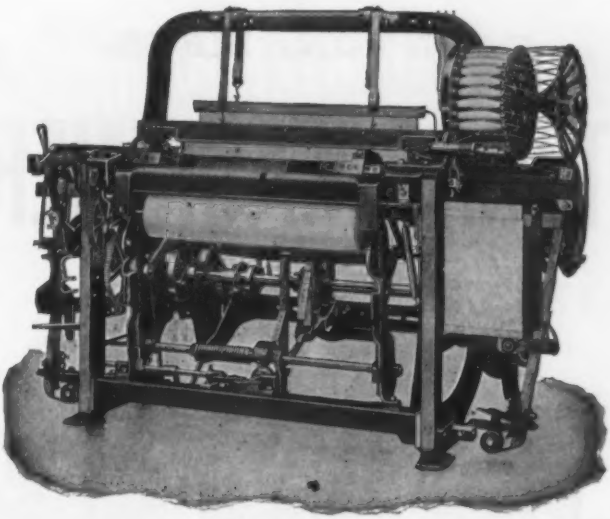

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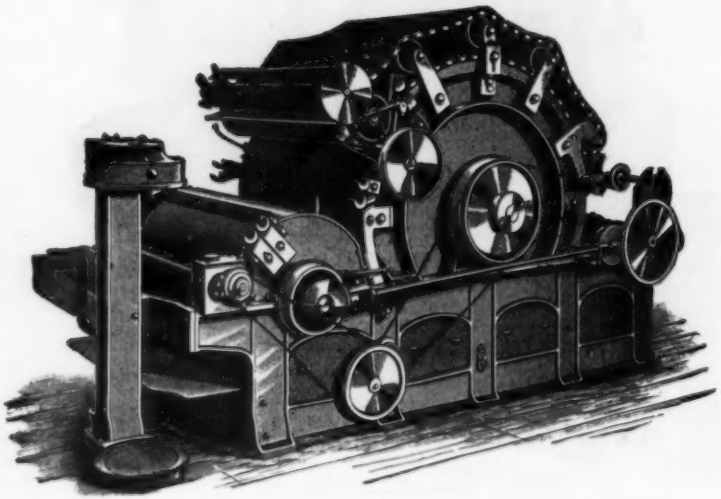

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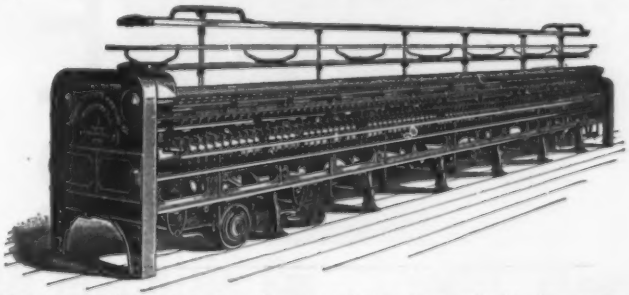

This New Pattern Spinning Frame contains many valuable improvements which will certainly interest you and pay you to investigate. All parts are specially designed and so constructed as to obtain the highest speed and greatest production.

We Invite Investigation and Comparison.

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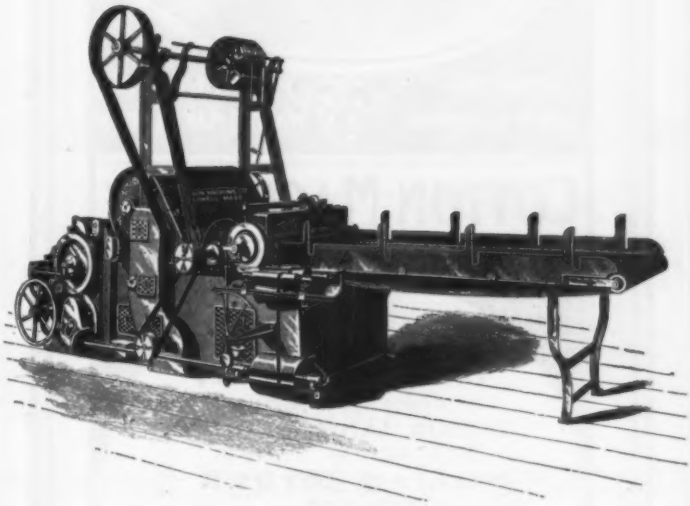

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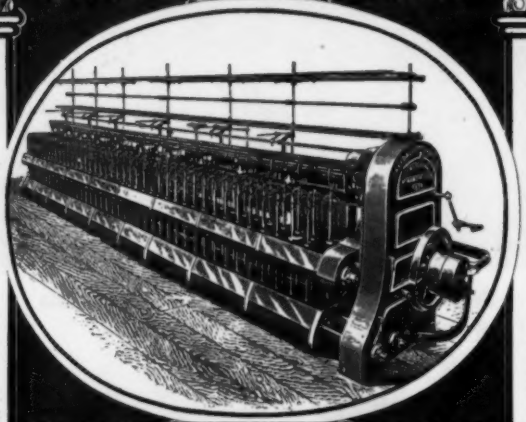

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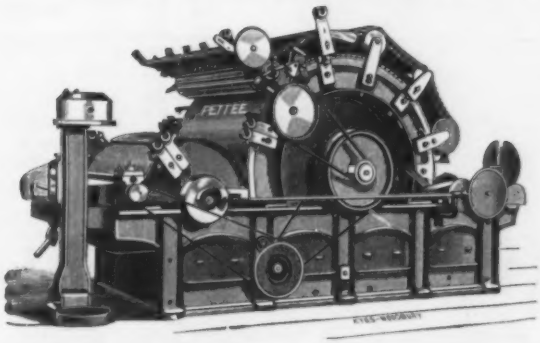

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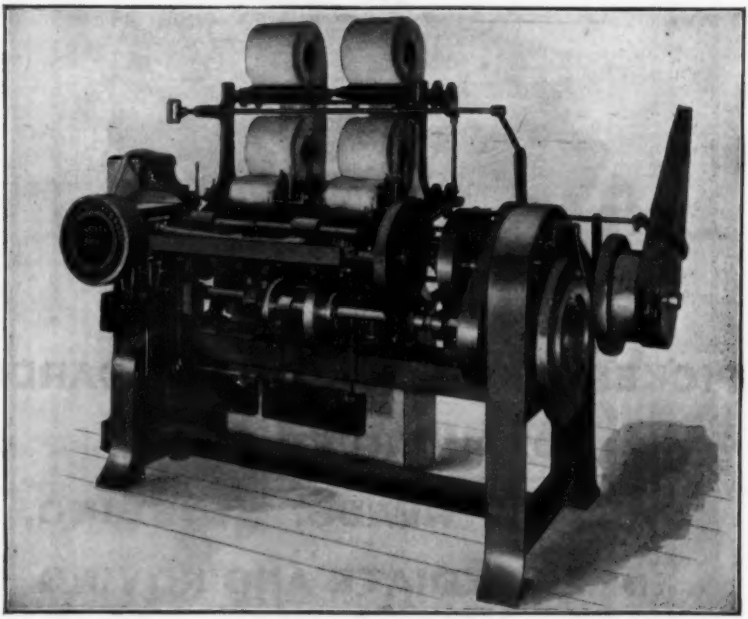

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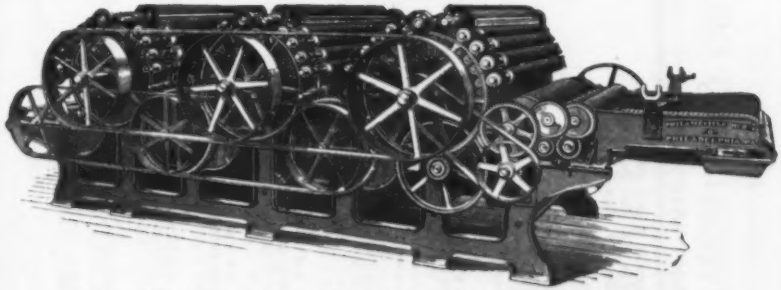

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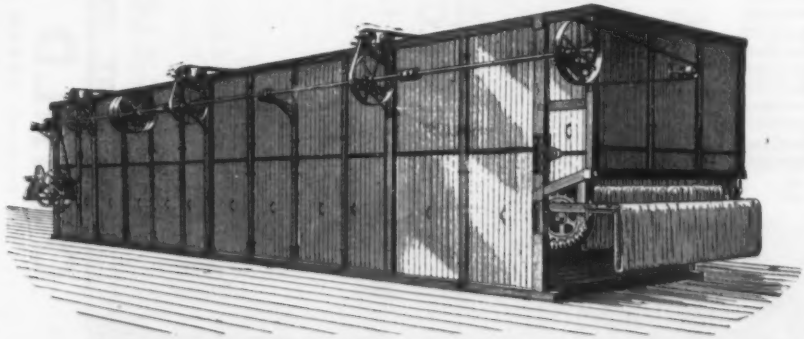

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The machine does the whole thing.
It is cheap, serviceable and durable.

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BUILDERS OF

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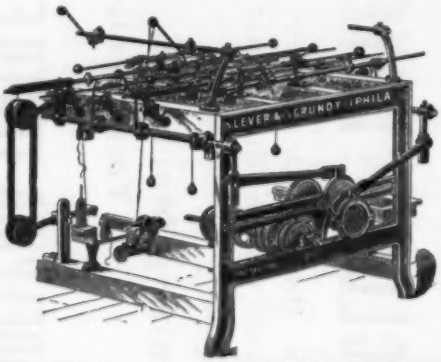

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BANDLESS SPINDLE SPOOLING MACHINES. Adapted to the finer grades of yarn and to the finest silk.

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CONICAL and STRAIGHT TUBE WINDING MACHINES.

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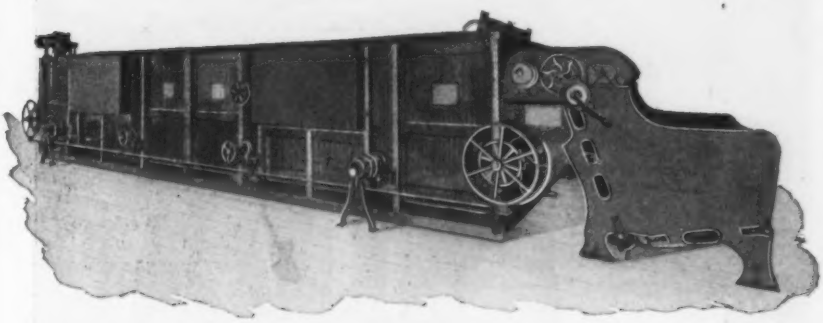

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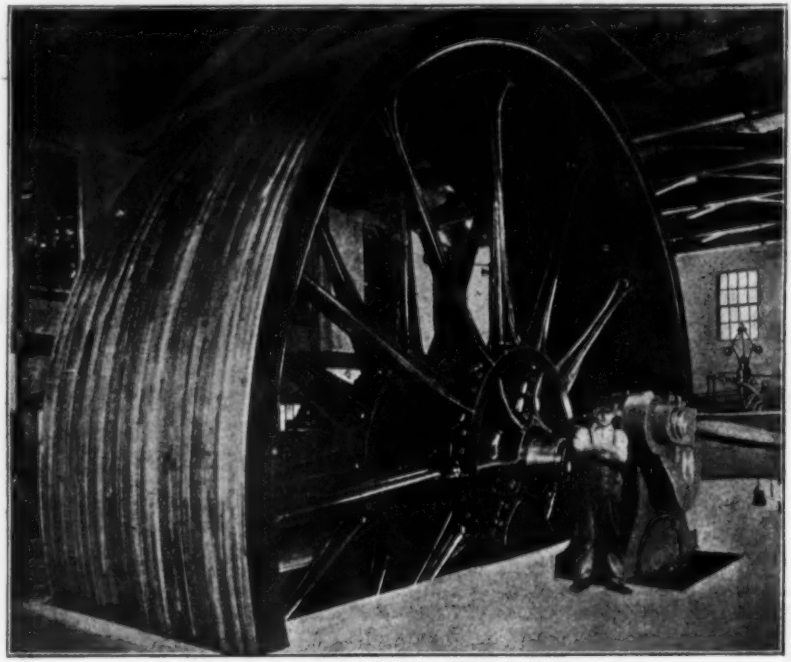

Announcement. It gives us pleasure to inform you that we have recently completed arrangements with the Amoskeag Manufacturing Company, of Manchester, N. H., in accordance with which we have taken over their wood-rim pulley department, including the fly-wheels as designed by Mr. Charles H. Manning, their Superintendent, and in this connection he has consented to act as our consulting engineer.

As to Construction.—In the construction of the fly-wheel shown in our illustration, width is 30 ft. diameter, the arms are so designed that each one will safely carry the belt-strain coming on its half of the wheel if the other eleven arms were entirely relieved, and the bolting of the hub is sufficient to carry its portion of the rim if cut adrift from the remainder of the rim

The rim is built up in courses of thoroughly kiln-dried wood of from 3 to 4 inches in thickness. The butts in each course are left open ⅛ of an inch at the outer ends, and well-fitting hard-wood wedges are driven in on hot glue, with a heavy sledge, as are also the hard-wood keys between the outer ends of the arms and the rim. Each piece in every course is thoroughly glued and secured in place with 3½-inch lag bolts

As to Safety.—Compared with iron, the wood rim is ten times safer than the cast-iron when the castings are good. This allows the wood-rim pulley to increase its speed to 3.25 times that of a sound cast-iron one, with equal safety.

As to Weight.—A fact not generally known is, that nearly all large cast-iron wheels which serve as balance wheels on steam engines are much heavier than is really necessary, owing to the great difficulty of constructing such large wheels from light castings. Builders are obliged to make the segments very thick to insure good castings and to allow sufficient stock for finishing, and are generally sure to make all parts heavy enough to meet those ends, hence they get wheels that are too heavy.

A wood-rim wheel, constructed in the manner shown in our illustration, is heavy enough for regulation, and yet many times stronger than an all-iron wheel.

We invite your attention to the consideration of this method of construction when accidents, contemplated changes, or other reasons interest you, and we will be pleased to give further information on request.

CHASE PULLEY COMPANY,

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As Manufacturing Engineers

OUR MISSION ON EARTH
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We originated the "Independence" Wood Split Pulley, now universally used the world over. We were also the pioneer manufacturers and patentees of the "Dodge" American System of Manila Rope Transmission—acknowledged as the most economical and modern means of transmitting and distributing power. We have installed thousands of these drives.

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No bent stirrup resting on rolls.

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for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, **Doublers**, Measuring Machines, Reelers, Singeing and Finishing Machinery. Special machinery.

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STANDARD TRAVELER CLEANERS,
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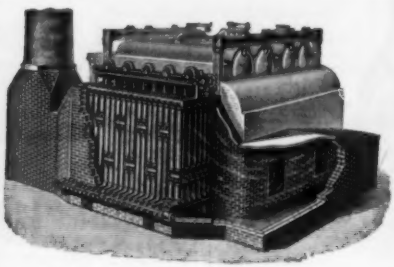
SAVES 10 TO 20 PER CENT IN FUEL



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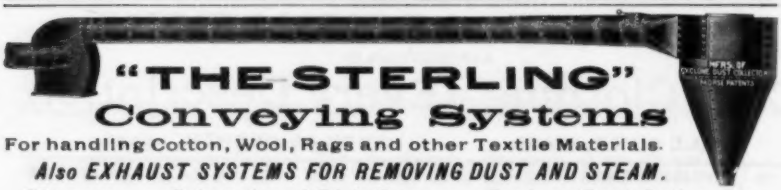

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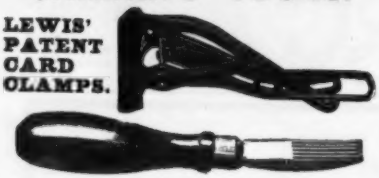

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TRY THEM.
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WOOLEN MILLS

Can be done better with less expense if WYANDOTTE WASHING SODA is used.

It has a softening effect on the goods that no other scouring material produces.

If you want soft, fluffy, clean woolens, you certainly should use

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Here's what a few of the woolen mills have to say:—

Please send us as soon as possible 5 bbls. WYANDOTTE WASHING SODA. We will be large users so give us the right price.

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We have used your WYANDOTTE WASHING SODA in wool scouring for the last eight months with satisfactory results. The cost of scouring has been materially reduced with noticeable improvement in the condition of the scoured stock.

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"Our Engineer Estimates

that we have saved about 75 per cent. of our engine oil for use the second time with your

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We cannot advise just how much this will amount to in dollars and cents, but consider that the Filter is giving good satisfaction."—*American Tube & Stamping Co., Bridgeport, Conn., Sept. 11, 1902.*

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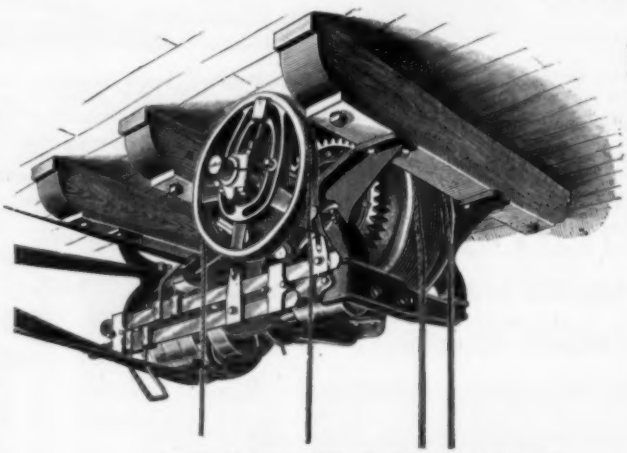

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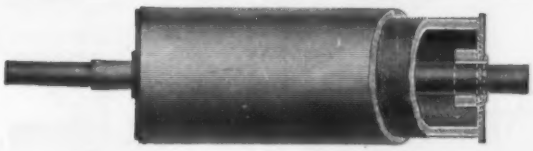

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LOOMS, DOBBIES, HARNESS MOTIONS

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Hot, cold, wet or dry

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is scientifically compounded, and a very thin coating, not enough to gather dust, keeps the pores of the belt **air tight**. It is the perfected result of fifteen years's experience; preserves the belts, and prevents them from slipping, for the least cost, and with no trouble whatever.

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Roving Spindles and Flyers a Specialty.
Light Forgings. Repairing of all kinds.

IF YOU USE CUTS
HAVE THEM ELECTROTYPED BY

ECONOMICAL — DURABLE — SATISFACTORY
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HARD & FLEXIBLE FIBRE : : : :

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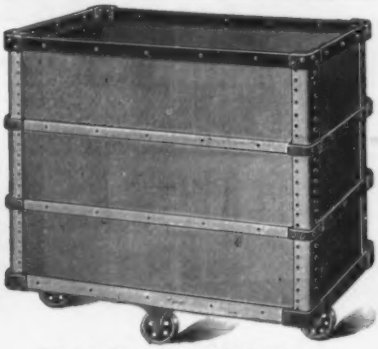
The "20th Century" Laminar Can.

Laminar Taper Box with hardwood shoes. Top View.



Laminar Car or Truck with Corners and Steel Top Rim.

Laminar Taper Box with hardwood shoes. Bottom View.

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BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation: Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one half pound per inch diameter. SIZE—All cans to an exact size, perfectly round and true. DURABILITY—Superior to any other can.

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Are replacing all other kinds where hard usage is given and where **lightness, strength, durability** and **cheapness** are a consideration. Some of the comparative results in big mills are remarkable. Send for our booklet. We make all styles and shapes for every kind of mill use.

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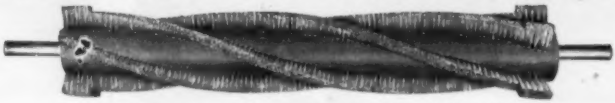
REVOLVING FLAT CARD BRUSHES



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Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.

BOX SHOOKS and CLOTH BOARDS.

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ELLIOT CLOTH FOLDER AND MEASURER

For Cotton and Gingham Mills, Bleacheries, Print Works, Etc.

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ICE RAKES.

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Write for List and Prices. With or without handles.

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1901 PATTERN

Patent Linen Winder for Shuttle Bobbins

With Patent Variable Motion.

Winds from below and from 90" skeins direct to shuttle bobbins. Impossible to wind yarn any harder. Runs at high speed, gives large production. Cleaners attached, to rub off dross and loose fibres from the yarn.

We also build a line of SPOOLING, WINDING, WARPING and BEAMING MACHINERY. Write for particulars.

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Successor to W. W. Altemus & Son,

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Has placed upon the market

A Cold Air Drying Machine for Yarn.

He is also building a first-class hot air machine. Claims to deliver yarn in far better condition than most machines.

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It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

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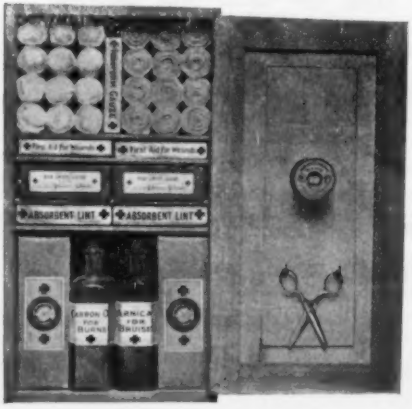
Nobody knows what to do or has anything to do with until the doctor comes and every minutes delay counts against the injured.

The Standard Accident Cabinets

Are designed for just such emergencies.

No. 2. Cabinet. Contents.

6 Rolls Linton Bandages, 2 in.
6 " " " 2½ in.
3 " Cotton " 1½ in.
3 " " " 2 in.
3 " " " 2½ in.
3 " " " 3 in.
2 Packages first aid for wounds.
2 " Linton Gauze.
2 " Absorbent Lint.
2 " " Cotton, ¼ lb.
1 " Iodoform Gauze.
1 Roll Adhesive Plaster.
1 Pair Scissors.
1 Spoon.
1 Package Safety Pins.
2 Medicine Glasses.
1 Bottle Carron Oil.
1 " Arnica.
1 " Witch Hazel.
1 " Essence Peppermint.
1 " Aromatic Spirits Ammonia.
1 " Sun Cholera Mixture Tablets.
1 " Soda Mint Tablets.
1 " Rhinitis "
1 Bottle Headache Tablets.



No. 1 Cabinet. Contents.

6 Rolls Linton Bandages, 2 in.
6 " " " 2½ in.
3 " Cotton " 1½ in.
3 " " " 2 in.
3 " " " 2½ in.
3 " " " 3 in.
2 Packages First Aid for Wounds.
2 " Linton Gauze.
2 " Absorbent Lint.
2 " " Cotton, ¼ lb.
1 12-oz. Bottle Carron Oil.
1 12-oz. " Arnica.
1 Roll Adhesive Plaster.
1 Package Iodoform Gauze.
1 Pair Scissors.

These Cabinets contain only the h'ghest grades of medicines and bandages which are thoroughly sterilized and antiseptic.

Price No. 2, $10.00.
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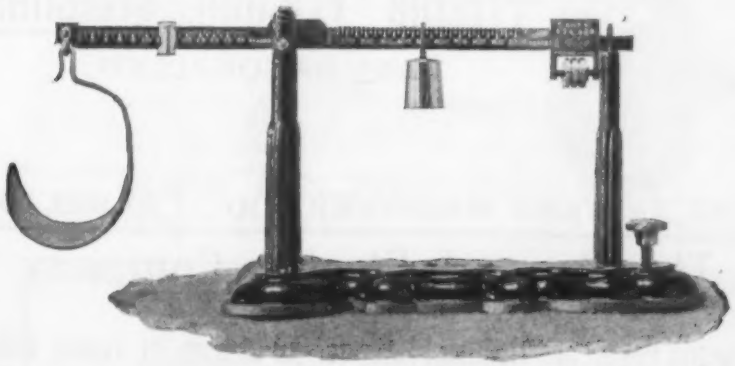
A ROVING or YARN SCALE

That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



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One of the Most Sensitive Scales Made. Positive and Accurate. Send for prices.

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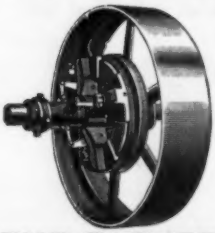

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They are Simple, Strong and Durable.
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BRAIDED FABRICS.

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Gear Cutting Machine

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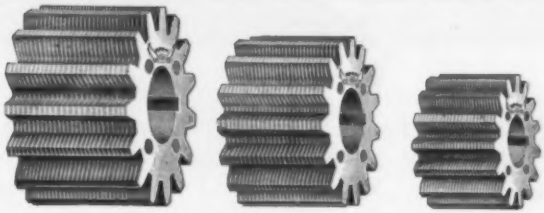

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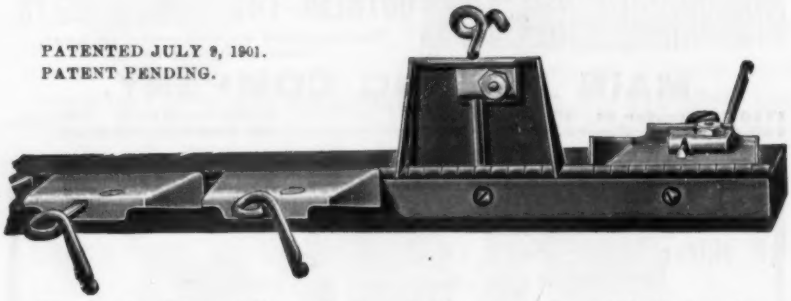

The only Thread Board that *holds a guide solid* all the time; *never* gets loose. Saves "broken ends" because it is never out of adjustment. It is *always right*.

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AUTOMATIC FILTERS AND PURIFIERS.
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Your soap consumption reduced from 10 lbs. up, per 1000 gallons of water used.

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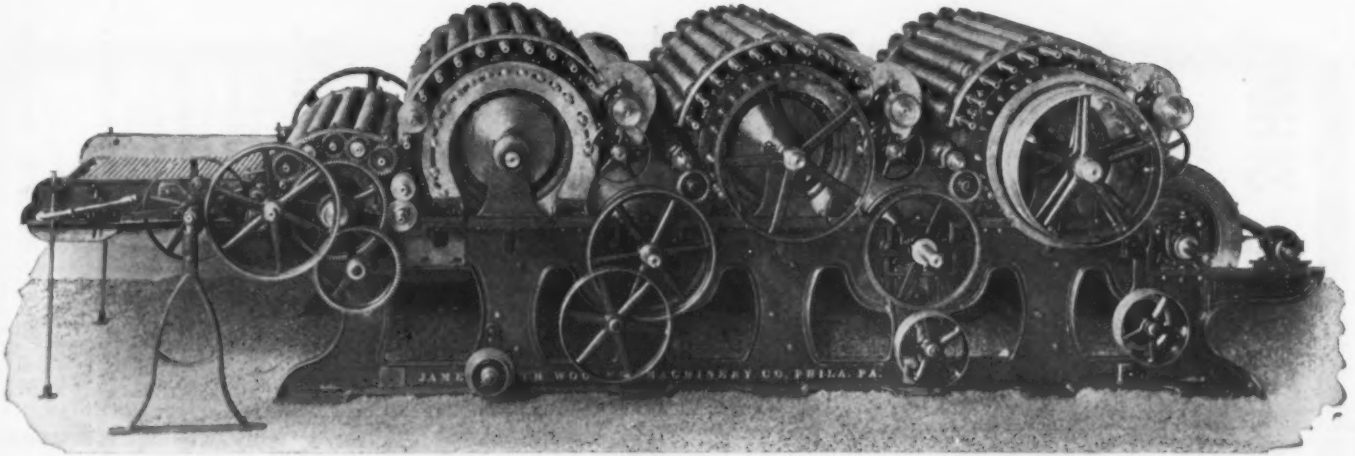

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Improved Automatic Self-weighing Feeders for First Breaker Cards and Garnetts; also Self-Feeders for Wool and Mixing Pickers, Burr Pickers; Wool Washers, etc.; Apperly Feeds and Blamire Lap Feeds.

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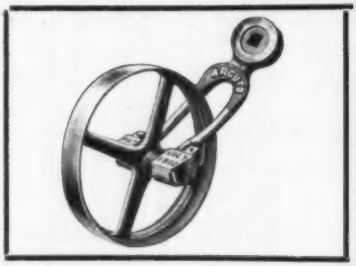

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And then you would be done with accidents.

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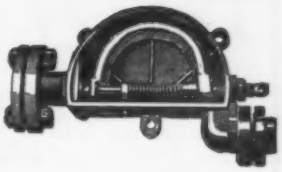

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Cotton Compress. 707,679. John L. Denton, Whitewright, Texas, assignor of one-half to McMillan & Lively, Whitewright, Tex.

Carding Machine. 708,046. William H. Hoyle and Thomas Barker, Bolton, England.

Carding Machine. 708,250. Henry A. Owen, Whitinsville, Mass., assignor to the Whitin Machine Works, Inc., Whitinsville, Mass.

Cotton-Fiber Condenser. 709,090. J. M. Gardner, New London, Conn.

Cleaner for Spinning Machine. 708,061. Severin Mock, Pawtucket, R. I. and Charles D. Robinson, Crompton, R. I., said Robinson assignor to said Mock.

Filer for Spinning and Doubling Machine. 708,945. T. Watson, Bridge of Weir, Scotland, assignor to Ernest Symington Coats, Paisley, Scotland.

Knitting-Machine Needle. 707,980. Robert W. Scott, Philadelphia, Pa., assignor of one-half to Louis N. D. Williams, Ashbourne, Pa.

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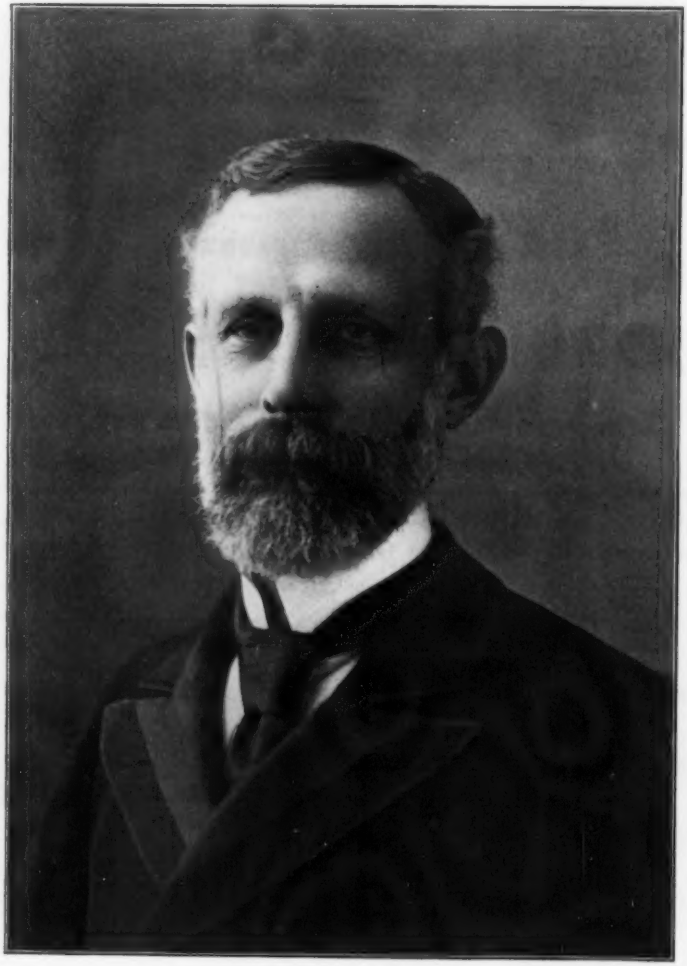

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TEXTILE WORLD.

OCTOBER, 1902. No. 4.

JOHN HOPEWELL.

John Hopewell, a leading merchant and manufacturer with offices in Boston, New York and Chicago and mills at Sanford, Me., is a native of Greenfield, Mass., born February 2, 1845, the son of John and Catherine Hopewell. When he was a year old his parents moved to Shelburne Falls, Mass., and there his early education was obtained. He attended the public schools until he was fourteen, when he went into the establishment of Lamson, Goodwin & Co., to learn the cutlery trade. A part of the time while there he attended the night school at the academy and afterward studied at a private school.

In 1861 he went to Springfield and during the Civil War was employed in the United States armory at that place. He also attended the night school and studied bookkeeping. After a three years' stay at the armory, Mr. Hopewell, then 20 years of age, left to attend a business college for a year where he studied bookkeeping, mathematics and commercial law. Not finding employment in a mercantile business after his graduation, and not being in a position to idle his time away, he returned to the factory. After a few months spent at the bench he decided that mechanical life was not to his taste, and he gave up his position without the slightest idea what he was going to do, but with the determination to make a place for himself in the commercial world if hard work and persistent effort would do it.

With no experience whatever he accepted the first thing that offered, which was canvassing for books, and the first month made several times the amount of his salary in the factory. At the end of a year he had made such a reputation that a publishing house engaged him to open an office in Albany, with the understanding that they should publish a series of books. He made the office at Albany a success, but the firm were financially unable to go into the publication contemplated, and after a year, at his urgent request, they sold out their interest and relieved him.

Mr. Hopewell always felt that if he could gain a position with some manufacturer on the road he could be a success as a salesman, never doubting his ability in that line. He then associated himself with Josiah Cummings of Springfield, a trunk manufacturer and jobber, who was also a large distributer of the blankets made by L. C. Chase & Co., of Boston. After three years with Mr. Cummings he obtained a position with L. C. Chase & Co. who, in connection with Mr. Thomas Goodall, had built the Sanford Mills at Sanford, Me.

L. C. Chase & Co.'s business at the Sanford Mills was very small at this time, but from 1870 to the present there has been a steady growth. The extensive mills at Sanford speak for themselves as to the ability of the combination between the Goodalls and L. C. Chase & Co. of Boston.

Subsequently Mr. Hopewell handled the Chase goods on the road and then came to Boston as their representative. At that time they, in connection with Thomas Goodall, had just erected the Sanford Mills, at Sanford, Me. After Mr. Hopewell's connection

with the concern, the business rapidly increased, and in 1888 he succeeded the Chases, becoming the head of the L. C. Chase & Co. firm and treasurer of the Sanford Mills.

Though much interested in public matters and often urged to accept political office, he took no active part in politics until the year 1887. In 1889 he was elected president of the Cambridge Republican Club, which office he held for three years. In 1891 he was elected to the Legislature, and in the spring of 1892 was repeatedly solicited to stand as candidate for Congress as a representative business man, but owing to ill health following a severe attack of the grip, he declined the use of his name for any public office, and spent a year in travel abroad.

Through his efforts in 1888, in the Legislature, the Massachusetts statutes were so changed that old established houses can continue the old firm names with special partners, with the consent of the retiring partners, a much needed reform in this state. Politically he is an ardent Republican and protectionist, and has been a director of the Home Market Club since its organization.

Of late years he has been largely engaged with his brothers Frank and Alfred under the firm name of Hopewell Bros. in raising Guernsey cattle on the Maple Ranch Stock Farm at Natick. They imported direct from Guernsey valuable herds, carefully selected with the aid of an expert for their butter producing qualities, and they have supplied some of the finest farms in the country with high grade stock, among them that of ex-Vice-President Morton, on the Hudson.

Mr. Hopewell was married in 1870 to Miss Sarah W. Blake, daughter of Charles and Betsey (Pease) Blake of Springfield, and his family now consists of three boys and two girls. Mrs. Hopewell's great-grandfather was in the Revolutionary war and her grandfather in the war of 1812.

Mr. John Hopewell is at present the senior partner of the L. C. Chase & Co., a director of Sanford Mills, president of the Reading Rubber Mfg. Co., director of the National Bank of the Redemption, director of the Boston Electric Gas-Light Co., director of the Home Market Club, chairman of the executive committee of the Boston Merchants' Association, member of the committee of the National Woolen Manufacturers' Association, one of the vice-presidents of the Massachusetts State Board of Trade, president of the Cambridge Club, a club composed of the principal men of that city, also a member of the Colonial and Union Clubs of Cambridge, the Boston Art Club, and the Boston Athletic Association. He was a delegate to the Republican Convention at St. Louis that nominated President McKinley the first time.

His career shows what can be accomplished by integrity, industry and perseverance, with constant readiness to improve opportunities. He began with only himself to rely upon. No with only himself to rely upon. No one aided him with wealth or influence. He simply struck out for himself and his success should prove an inspiration to the young men of today. Conditions now are in many ways more favorable than forty years ago, for those who, like John Hopewell, will do their best and then be content.

MONTHLY COMMENT.

The Tariff Question has become one of the leading issues before the country with such suddenness that politicians, high and low, have found themselves utterly unprepared to meet it. The refusal of Speaker Henderson to accept a renomination on the grounds that, as a protectionist, he would misrepresent the party in his district, and the victory of Eugene N. Foss in a Massachusetts congressional district, in which the successful candidate declared unequivocally for free hides,

coal and iron, are signs of a state of public opinion that it would be folly to ignore.

While there is an unmistakable sentiment for tariff revision, it is a sentiment that favors the protective principle. The people have not lost their senses and have no desire to repeat the mad experiment of 1892 that gave the country the Wilson-Gorman-Cleveland tariff bill and hard times for six years.

The suggestion had lately been renewed that a tariff commission is the remedy for our tariff ills and that such a committee of able men working steadily could collect a fund of information upon industrial conditions at home or abroad that would enable Congress to keep the rates adjusted to the varying needs of the country.

Such a commission properly organized would after a number of years undoubtedly be of great assistance in revising the schedules of a tariff.

The thing most to be dreaded is not so much a revision of the tariff at the hands of the friends of protection or upon lines suggested by an impartial commission, as the uncertainty and check to business caused by the agitation of the subject at all. However, much as we may "prefer the ills we have to those we know not of," it is useless to deny that the tariff question is likely to be agitated and strong efforts made for its revision.

Scarcity of Worsted Carpet Yarn. Ingrain carpet manufacturers are disturbed by the inadequate supply of carpet worsted yarn. It appears that some manufacturers who formerly catered entirely to the carpet trade have turned their machinery, so far as possible, on to finer grades, in order to take advantage of the large demand from men's wear and dress goods weavers. The shortage in the yarn supply has caused a tardiness in deliveries on the part of ingrain carpet manufacturers. The price of this class of yarn has gone up from five to seven cents since the beginning of the season, when contracts were placed. This will necessitate a corresponding increase of about three cents a yard in the cost of all wool extra supers.

The German Tariff Bill has emerged from the committee and in its present form is highly protective for the agrarian interests. A high duty is imposed on foodstuffs. If carried into effect this will raise the price of the necessaries of life to the German workman in manufacturing industries and thus indirectly injure the German manufacturer. It is believed that the high rates have been adopted to give Germany a chance to trade with other countries by means of reciprocity treaties. The higher the tariff is, the greater will be the concessions she can make in return for reciprocal concessions by other countries. Business in Germany at the present time is greatly depressed. This is due in great measure to the uncertainty regarding the final form which the new bill is to take.

Cotton Goods Trade of Cuba. The Cuban trade returns for May offer some slight encouragement to American cotton manufacturers. In January of this year our share of the cottons imported into the island was 6 2/10 per cent.; in February, 8 8/10 per cent.; in April, 6 8/10 per cent.; while in May, the last month for which returns have been made, the share of the United States jumped to 11 per cent. This is still insignificant but encouraging. The total value of these imports of cottons in May was $291,322, divided as follows: Great Britain, 53 per cent.; Spain, 15 per cent.; France, 13 per cent.; United States, 11 per cent.; Germany, 6 per cent.; all other, 2 per cent.

The Aniline Color Industry. In an address before the English Society of Chemical Industry, Ivan Levenstein gave an interesting account of the transference of the aniline color industry from England to Germany. He

ascribed the change to the lax patent laws of Germany in the sixties and early seventies, during which the discoveries of English and French chemists were used by German firms, who were under no obligation to respect patents, as none existed in their localities.

The English firm that brought out the well known Nicholson's or Alkali Blue sought protection by keeping the process of manufacture a secret, but the smart German chemists discovered its composition by analysis and were soon turning the color out from the German works in immense quantities. Mr. Levenstein arrays his facts in a very convincing way to show that this appropriation of the ideas of others gave to the German industry in its early days a momentum that soon made its progress irresistible. The result is that the Germans have a virtual monopoly of this great business.

While this theory may be correct, it is none the less true that without the exercise of ability of the highest order the Germans could not have controlled the manufacture of aniline colors. Patent laws may have helped them, but their original discoveries in this line are among the greatest achievements of modern chemistry and have kept them in advance of all competitors in this line.

Trade with Peru. It is reported by the German press that the export trade of Germany with Peru has been greatly stimulated by the German consuls in Peru, who have distributed among Peruvian buyers a great mass of circulars, letters, price-lists and samples of goods from manufacturers and exporters in Germany. The consuls have in fact acted as commercial agents and pushed German goods in every possible way.

The Peruvian government has sought to promote trade with other countries by extending the scope of the permanent exhibition of machinery and products in Lima to include the exhibition of all kinds of commercial wares.

The example of the German consuls in extending their country's trade with Peru might be followed with advantage by the consuls of the United States.

Cotton Manufacturing in India. The American people can no longer afford to ignore industrial conditions in other countries than their own. Our recent acquisition of territory in distant parts of the world has brought us face to face with social conditions that before were of but indirect interest. But apart from this, the necessity for foreign markets for surplus American products will compel us to become better acquainted with the rest of the world.

The production of cotton yarn in Bombay and the current wages paid in India, for example, have an important bearing on the question of markets for our cotton goods in the far east. It is not so very long ago when cotton mills were springing up on every hand in this country under the inspiring cry, "The world's market for cotton goods belongs to those who raise cotton for the world." One result of that extension was to make the domestic market for coarse cotton yarn what it still is to a large extent, a buyer's market.

The enthusiasm that prompted that cry did not take into account the industrial conditions of India, which have made it possible for Indian cotton spinners to drive English yarn from the Chinese market.

Sooner or later our domestic production will overtake domestic consumption and the buoyant prosperity of today be made dependent upon a colossal extension of our foreign trade.

In cotton yarn this necessity must contend with the cheap labor of Asia. Last April there was spun in India 49,261,973 lbs. of cotton yarn, of which 35,649,133 lbs., or over 72 per cent., was the product of the spindles of Bombay, which are working on the

finest sizes spun in the country. Despite this fact, we find the Bombay product to consist chiefly of sizes below No. 20. Following is a classification of the April production:—

Nos.	Pounds.
1 to 10	10,054,620
11 to 20	18,842,482
21 to 30	5,795,090
31 to 40	925,651
Above 40	31,290
	35,649,133

The average size being No. 14. This coarse yarn is made by the lowest paid labor on earth. Following is a statement of Bombay wages in 1901, taken from the official factories report of that presidency:—

Skilled Labor:

Spinner (man)	19 cents per day
Weaver (man)	15 cents per day
Dyer	14 cents per day
Engineer	39 cents per day
Blacksmith	31 cents per day
Carpenter	26 cents per day
Bricklayer	32 cents per day

Unskilled Labor:

Coolie (man)	10 cents per day
Coolie (woman)	6 cents per day

It is with such conditions as these that we must reckon if the time ever comes when our high wage level depends on the foreign market.

The squalor and misery that such compensation entails has reduced the vital forces of the wretched Indian so low that he is actually unable in some industries to give an equivalent for the miserable pittance he receives, and the spectacle is presented of European articles driving the Indian product from the markets of India. This, however, is not the case in the cotton industry, where the Indian product has practically driven coarse English cotton goods from the field.

Higher Priced Goods. One result of the continued prosperity of the country is the increased demand for higher priced goods, which is especially noticeable in the textile trade. The consumer is no longer under the necessity of wearing the cheap trash of a few years ago. With money to pay for better material, he wears better clothes, and the retailer, jobber and manufacturer, who are but the servants of the consumer, have no other course open but to supply the changed demand. Textile manufacturers in all branches may well take note of this tendency. The manufacturer must still strive to give as much value for a dollar as possible, but he is no longer under the necessity of catering to a pressing demand for mere cheapness. The American people want to be well dressed. They instinctively know that the quality as well as the yardage of textiles counts in buying clothing, and that the higher priced garment may prove more economical than the cheaper one. It takes several years of prosperity to place the consumer reduced by tariff reform in the position where he can buy better clothes, and we have had those years. Clothing is not the first necessity to respond to the effect of good times. Food and shelter must first be provided. For four years the country has been convalescent after the free trade attack of 1892, and it is but recently that improvement in the textile trade has become pronounced.

The Abolition of Likin. The recent report from China that the imperial government of that country had concluded a treaty with Great Britain by which Likin was to be abolished, can not be said to have been of absorbing interest to the American people, of whom many may have assumed that Likin was the name of some obnoxious Chinese official whose abolition was to be accomplished probably by the headsman's ax.

Likin is the name applied to taxes imposed on merchandise in transit through the interior of China. It is collected by the viceroys of each province, who fix the rates themselves,

and who send a portion of the amount raised to the imperial government at Pekin.

The officials at Pekin who, it is reported, have agreed to abolish Likin, have no direct control over its collection, and are, in fact, the chief beneficiaries, while the viceroys whose chief source of revenue is Likin, have had no voice in deciding upon its abolition.

Foreign residents in China who have spent years there and are well acquainted with the Chinese character, declare it absurd that such a firmly rooted Chinese privilege as Likin can be abolished by a treaty with the imperial government. One of these, S. M. Moses, now chairman of the Bank of Bombay, states that the uncertain character of Chinese promises makes it extremely likely that the agreement to abolish Likin will result either in no change at all or in the speedy reappearance of Likin in a new and perhaps more objectionable form.

At the present time each viceroy fixes the rates to suit himself and the only relief from the "squeeze" comes from the efforts of each one to attract traffic to his own province by reducing the Likin charges.

Thus it appears that, instead of one outside door to be kept open to trade with China, there are an indefinite number of inside doors in the interior of China, where prejudice against the "foreign devils" is strongest.

The Metric Question. In this issue appear two articles on the use of the English and metric systems of weights and measures in textile manufacturing, and our columns are open to further discussions of this important and much neglected question.

Our consideration of this metric question must be confined mainly to its application in the textile trades, and it will be difficult to name an industry in which so many calculations involving weights and measures are in such constant use by both manager and operatives, as textile manufacturing.

There are a few industries, the chemical for example, where the use of a special system works no inconvenience to the people in general, who have no occasion to employ its special standards in their daily occupations, but with such few exceptions the interests of all trades and professions are intricately connected with each other in the matter of weights and measures.

Twice only in the history of this country has the metric system in its broad aspects been investigated for the public benefit with the thoroughness its importance demands. Both times ability of the highest order was employed and both times the decision was against the introduction of the metric system into the United States.

John Quincy Adams, at the request of Congress in 1817, studied the question for four years and gave his views and conclusions, adverse to the introduction of the metric system, in a report that for breadth of vision, minute attention to detail and impartial conclusions has no equal.

The second investigation was made by the University Convocation of the State of New York in 1866 at the request of Hon. John A. Kasson, member of the House committee on coinage, weights and measures. Again four years was devoted to the study of the question, this time by such men as Chancellor J. V. L. Pruyn, Prof. Charles Davies and Regent Robert S. Hale, and their conclusion, adverse to the metric system, is made the more impressive by the fact that they entered upon the study of the problem with little doubt but that that system would be approved.

Two investigations of such duration and thoroughness by men of such ability, warrant an interrogation point being placed after the metric question.

It is Worth While.

BY WM. W. CROSBY,
Principal of the Lowell Textile School, Lowell, Mass.

An article which appeared in the columns of the August issue was headed, "Is It Worth While?" referring to the proposed change from the ordinary English units to those of the metric system, with reference to the advantage of the one over the other in the solution of a problem in cloth analysis.

A piece of simple goods was chosen, with the data in both metric and English units. The figures used in both solutions were printed, showing the actual operations, and some comparison was made in the number of figures necessary in each process.

The result showed nothing that would prove the advantage of either over the other so far as the actual solution was concerned, and when the inconvenience of learning a new system was taken into account, made it seem that there would be a loss rather than a gain if metric units should be introduced.

There is much food for reflection in what was said in the article in a general way about a people changing from one system of measurement to another, and it would serve for a lengthy discussion, but time will not be taken for that purpose now, although some of the points in the numerical part of the work may be interesting to consider. No effort is too great to put forth if there be a gain which justifies the movement.

If the metric system is of use, its claims must be justified by concrete examples, for "glittering generalities" are productive of no good. As many as possible of the phases of the situation must be scrutinized closely and the relative merits of the two systems of measurements made clear. When this work has been carried to a reasonably complete stage, some intelligent conclusion may be arrived at.

Until such a time, there must be much bickering and many fruitless arguments on the part of those who will gain or lose some advantage whichever way the question is decided. What is done must be for the greatest good of the greatest number.

In the particular case in question, a piece of woolen goods was chosen as the basis of discussion. It contained but one kind of yarn, and the problem was a most simple one. It involved merely the calculation of the size of the yarn from a few strands drawn from the sample, the number of ends necessary to construct a warp of given width, the weight per yard of the full width goods—in fact a regular problem in analysis.

Whether such a calculation were made by English or metric units, decimal, binary or duodecimal systems of numbers, it is to be doubted if there could be shown any advantage in one over the other systems.

There are many fabrics to be analyzed which contain several different kinds of yarn, involving different systems of counting or numbering according to current practice. In the English system it must be remembered that where cotton is measured in counts with 840 yards to the hank, worsted with 560 yards to the hank, and woolen both by runs and cuts systems using 1,600 yards in the former and 300 yards in the latter, the International or metric system measures all yarns on the same basis, so that there are no changes to be made in going from one kind of yarn to another.

That is to say, the counts may be determined by the number of meters of the yarn which equal one gram in weight. In such an analysis the advantage of the International over the English system is several fold. The lengths of the strands of the several kinds of yarn drawn from the template sample, need only to be weighed and the material noted, the counts being determined by the International system all on the same basis by a single operation, while as many separate operations must be made with

the other systems as there are different kinds of yarn in the sample.

There are common factors between many of the constants used in the English system, as for example the factor 16 occurring in 16 ounces to the pound and 1,600 yards in a run, and 280 occurring in both 560, the constant of the worsted system and 840 of the cotton system, making the former equal to 2/3 of the latter; these are of assistance in performing a calculation, but can never compete with the simple movement of a decimal point as in the metric system.

The article in the August number before referred to says, "The manufacturer soon connects the run equivalent with the cotton or worsted count, etc.," but this, "soon connects" is the vital point and is responsible for many costly errors and for the wasting of too much valuable time. We would not for a minute think of making two operations in any mechanical device where a single one would do the work. In fact, by carrying this principle out we have been enabled to manufacture goods of all kinds cheaper and better than many other countries in the world. Why then should we multiply our mathematical calculations in a useless way? Why have several standards for counts where one will do? The matter of using a table of equivalents for the different yarn systems is another way of multiplying detail needlessly.

So far as the "European Chaos of Calculations" is concerned, exception must be taken, as there seems to be no chaos except when they want to buy of England or America where there is apparently no logical basis for any of the units of measurements.

There is one more fact which must be kept clearly before us as a nation. We have now entered the markets of the world with goods to sell. We must put up our packages in such shape as to attract the buyer. When we were buying goods we might dictate as we pleased how they should be labeled and prepared for us, but we are on the other side of the question now and must be ready to meet it.

There is abundant evidence in many lines of manufacture to show that weights and measurements must be given metrically in dealing with foreign countries, and it is a fact that large quantities of our goods are already going out under these designations. If we would hold our trade, to say nothing of increasing it, we must use metric units.

Surely with the foregoing confronting us, we cannot afford to hide our heads like the ostrich and say that there is nothing to be seen, because we cannot see it. The situation confronts us and the sooner we adapt ourselves to the oncoming conditions, the better it will be.

It is not to be thought that some morning will find us with a lot of useless yardsticks and pound weights, necessitating our buying new tape measures with the meter inscribed thereon, or weights marked in kilograms. The change must come gradually while surely.

Boston will be no further from New York whether we express the difference in miles or in kilometers, and whether we think of it in miles or in kilometers will make but little difference. Where we have to use this dimension as a matter of calculation we would indeed be at fault if we failed to use such a system as would involve a minimum of effort for a maximum of attainment.

—The days are long and the years short to the idle man.—Diderot.

—Rascals are prone to think others like themselves.—La Bruyere.

—True happiness is found only in promoting that of others.—B. de Saint-Pierre.

—A habit is conquered more easily today than tomorrow.—Eastern Proverb.

Analysis of Union Goods by the English and by the Metric System.

A straight line measures the shortest distance between two points.—EUCLID.

The ability to analyze a fabric quickly and accurately and make an estimate of its cost is essential to every enterprising textile manufacturer. Samples, made abroad or in the mills of domestic competitors, are constantly submitted to every mill owner with the request to duplicate them at a given price.

Further than this, the sharp competition between the mills and the frequent changes in popular taste make it important that each manufacturer should keep a record of the construction, selling price and cost of all the fabrics directly or indirectly competing with his own.

It follows that the analysis of fabrics should be a constant feature of mill work. When there are no cloths to be analyzed in response to the calls of customers, the manufacturer should be dissecting current fabrics to know what is going on in other mills. Armed with the ability to analyze and estimate the cost of his competitors' goods, he can afford to laugh at the close guard kept at the mill gates behind which the goods are made.

As little as possible should be left to the judgment of the analyzer; all operations should be simplified and all calculations reduced to their lowest terms.

The claim, unfortified by figures, was made before the committee on coinage, weights and measures at Washington, that the metric system would greatly simplify calculations in the analysis of textile fabrics and thus save much labor now made necessary by our present system of weights and measures.

Let us put this to a practical test.

We will analyze two pieces of the same fabric, one by the English, the other by the metric system. We select for the test the "Varsity" vesting, just received from England and described by our English correspondent in this issue.

At Fig. 1 is the sample to be analyzed. At Fig. 2 is a vest made from this cloth by an English tailor. At Fig. 3 is the residue of a sample of the goods after extracting the wool with caustic alkali. The cloth is known as a union fabric, that is, composed of yarns made from different materials; in this case cotton and worsted.

FIG. 1.

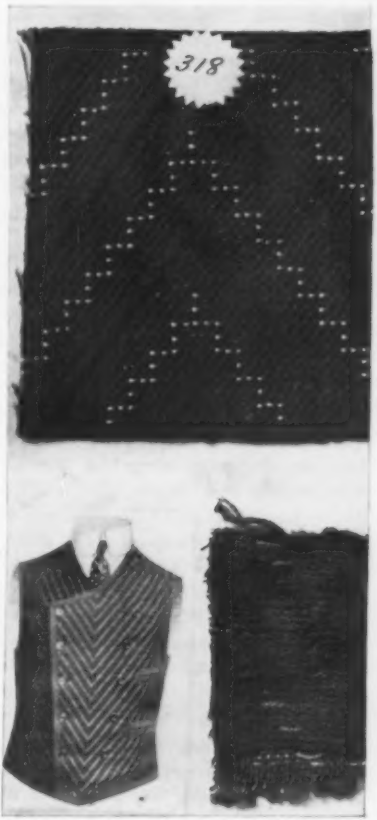


FIG. 2. FIG. 3.

Having but a few square inches of the goods it is obvious that the weight of cloth and size of yarn must be calculated from the weight of a small sample of known dimensions. This piece is best cut by

a steel die, which eliminates all possibility of error. The sample should have an area of about four square inches, because this is a size not so large as to make the raveling of the threads unnecessarily laborious, nor so small as to make error probable.

For the English system we will make the die 1 8/10 by 2 4/10 inches, with an area of 4.32 square inches, for reasons that will become evident as we proceed. We will designate this the English sample.

For the metric system we will make the die 40 mm by 50 mm, because these dimensions give an area expressed in even thousands of mm^2, and retain as far as is consistent with accurate work the decimal or metric basis. We will designate this the metric sample.

The next step is to find the "set" or number of threads in a given space. By the English system this is indicated by the threads of warp or filling per inch.

It may be a mere coincidence, yet is nevertheless a fact, that a distance approximating the English inch is best suited for gauging the "set" of most woolen and cotton fabrics. It is not so long as to make the counting of the threads too laborious. It is not so short as to cause a serious error by discarding a fraction of a thread.

For example, 27 warp threads per inch are equivalent to 6 3/4 per quarter inch. The omission of the fraction, 3/4, from the number of threads per quarter inch, means a difference of 168 threads in the warp for goods 56 inches wide, while the omission of a like fraction from the number of threads per inch means a difference of but 42 threads in the same width. Every practical textile manufacturer will recognize how important the difference, 126 ends, is in a 1512 end warp.

When we turn to the metric system, however, we find no unit of length corresponding even approximately to the English inch. The centimeter is less than 4/10 of an inch, and from this unit we jump by the decimal step to the decimeter which is equal to about 4 inches.

In the first case the metric unit is too short; in the second, much too long for computing the set of ordinary textile fabrics.

There is but one way to avoid the chance of error with the centimeter and the unnecessary labor with the decimeter, namely, to select as the unit a metric measurement approximating the English inch, say 3 cm. equal to about 1 1/5 inches.

That this is a practical difficulty with the metric system is shown by the following extract from Methodik der Bindungslehre und Decomposition fuer Schaftweberei, a standard German work on weaving by Franz Donat, Professor at the Royal Weaving School of Reichenberg:

"The threads in warp and filling are gauged by the number per decimeter. The use of the centimeter is unsafe (unsicher), because from 1/2 to 1 thread (even more in silk goods) may easily be overlooked."

Another indication of this defect is the fact that the French weaver, over one hundred years after the birth of the metric system, is still found using the inch for counting picks.

Proceeding with the analysis, we ravel enough warp and filling threads from the sample to permit counting the projecting threads in one inch or in 3 cm.

In the English sample, we find in the warp 62 worsted and 31 cotton threads per inch; in the filling 130 cotton threads per inch.

In the metric sample we count in the warp 74 worsted and 37 cotton threads per 3 cm; in the filling 153 cotton filling threads per 3 cm.

Four threads of filling slightly twisted together alternate with one thread, making it possible to weave 5 threads with 2 picks.

The next step is to determine the size of the yarn in warp and filling.

We ravel out both samples, keeping each kind of yarn separate. In

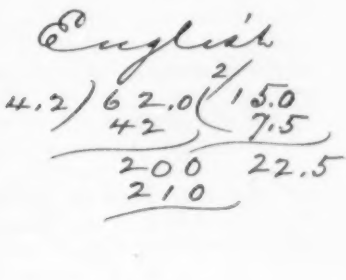
the English sample the worsted warp weighs 4 2/10 grains, the cotton warp 1 8/10 grains, and the cotton filling 7 grains. In the metric sample the worsted warp weighs 20 cg, the cotton warp 9 cg, and the cotton filling 33 cg.

We now calculate the size of each kind of yarn by each system as follows:—

Worsted Warp: English, Fig. 4, 22 figures; Metric, Fig. 5, 21 figures.

Cotton Warp: English, Fig. 6, 15 figures; Metric, Fig. 7, 19 figures.

Cotton Filling: English, Fig. 8, 16 figures; Metric, Fig. 9, 20 figures.



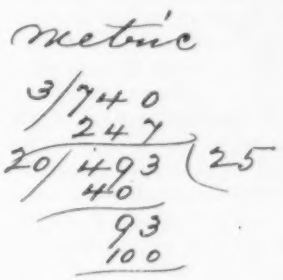


FIG. 4.

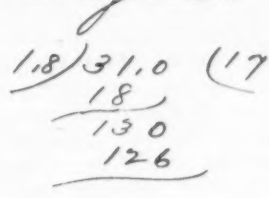
FIG. 5.

SIZE OF WORSTED WARP.

The total weight of the English sample is 13 grains, and with 15 figures we find the weight of the goods to be 13 6/10 ounces per yard 55 1/8 inches wide (Fig. 10).

We find that the metric sample weighs 62 cg, and with 18 figures we find the weight of the cloth to be 434 grams per meter 140 cm wide (Fig. 11).

The English constant for the



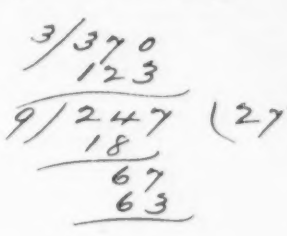


FIG. 6.

FIG. 7.

SIZE OF COTTON WARP.

weight per yard is calculated once for each width of goods and stamped on the side of the die. This

English
70/130.0 (19
70
600
630

Metric
3/153
51
33/102.0 (31
99
30
33

FIG. 8.

FIG. 9.

SIZE OF COTTON FILLING.

answers for all subsequent analyses. The metric constants for the die we have used are 10 and the width of the goods in centimeters.

Upon weighing a sample, then ex-

English
1.05
13
315
105
13.65

metric
2/62
31
140
1240
31
4340

FIG. 10.

FIG. 11.

WEIGHT OF FINISHED GOODS.

tracting the wool with caustic alkali and weighing the residue when dry, we find the cotton to be 66 per cent. of the original weight. This result is obtained by the same calculation with

There remain to be determined the nature and quality of the raw material, probable processes of manufacture, twist in the yarn, weave and finish of the goods. For this it is essential that the analyzer should have good judgment and practical experience, which, although neither aided nor hindered by either the English or the metric system, can easily

be impaired when the mind becomes clouded by the joint use of two standards for weights and measures, a condition certain to follow the introduction of the metric system into a country like the United States where the yard and the pound have become a part of the life, the literature, and the public and private records of the people.

Summing up the calculations we have made, we find 68 figures used with the English and 78 with the metric system.

In making these analyses we have used the decimal system for the metric sample, and what we will style the "straight line" method for the English sample. The operations show that the metric method requires 10 more figures than the "straight line" or English method.

The "straight line" method can, of course, be applied to the metric weights and measures, and the calculations then made as easily as with the English standards, but this can be done only by using a sample measuring 25 mm by 40 mm (approximately 1 in. x 1 5/8 in.), and at the sacrifice of accuracy in the analysis. Experience has demonstrated that a cloth sample with an area of 1 5/8 square inches is much too small for the analysis of union fabrics, in which there are often found several kinds of yarn, some in very small quantities.

Take the "Varsity" vesting, which in this respect is a very moderate example, and we find that with even twice the area mentioned, the cotton warp weighs but 1 8/10 grains. With this weight reduced one half or even more, the calculation would have no sufficient basis to warrant its use in mill work.

We have previously discovered that neither the French centimeter nor the decimeter is suited for gauging the "set" of textile fabrics, and now find that the use of the metric system gives us an area too small for the determination of the yarn sizes with an accuracy sufficient for mill work.

Are these things wholly accidental? The English system comes to us from the dim past, and its standards were based by our rude ancestors on the dimensions of the human body, the height, the size of the hand, arm and foot. It is a natural system.

The French or metric is essentially an artificial system, derived from a failure to determine the 10,000,000th part of the distance between the equator and the north pole, via Paris.

It may be that this inferiority of the metric system in the manufacture of textiles is due to its artificial character, an inferiority that was so well stated by John Quincy Adams when he declared his belief

> "that the French system, admirable as it is, looked in its composition to weights and measures more as exclusively matters of account than as tests of quantity; that in its eagerness for extreme accuracy in the relations between things, it lost sight a little of the relations of weights and measures with the physical organization, the wants, comforts and occupations of man; that in its exclusive partialities for decimal arithmetic, it forgot the inflexible independence and the innumerable varieties of the forms of nature, and that she would not submit to be trammeled for the convenience of the counting house.
>
> "The experience of the French nation under the new system has already proved that neither the immutable standard from the circumference of the globe nor the isochronous vibration of the pendulum nor the gravity of distilled water at its maximum of density nor the decimation of weights, measures, moneys and coins nor the unity of weight and measures of capacity nor yet all these together are the only ingredients of practical uniformity for a system of weights and measures.
>
> "It has proved that gravity and extension will not walk together with the same staff, that neither the square nor the cube nor the circle nor the sphere nor the revolutions of the earth nor the harmonies of the heavens will, to gratify the pleasure or to indulge the indolence of man, be restricted to computation by decimal numbers alone."

Moreover, the metric system is not only inferior to the English in textile calculations of this kind, but its use

is so restricted as to make it of but slight value even in the so-called metric countries, where the English system is in general use and the metric expressions must be reduced to the English sizes before they can be used in the work of most of the mills.

So much for the metric system in cloth analysis.

metric estimate. A pure metric estimate is seldom if ever used, because the prevailing standard by which textile raw materials and yarn are bought and sold in the markets of the world, is the English pound.

There are pure English and mixed (English and metric) estimates of cost used in the textile industry today. It will be sufficient here to consider

Kalkulation.

Ein Stück einen Meter breit und hundert Meter lang.

Kette per cm 24 Faden 48r Weft (Double).
Einschuss per cm 28 Schuss 40r Single Weft (einfach).
Rieth (Blatt) per cm 12 Rohr 2fädig.

Englische Weife.

Kette 48r Weft à 100 Meter 3¾ Gr.
2400 Faden = 240000 Meter = = 9000 Gr.
Verschmälerung 4 %, 96 Faden = 9600 Meter = 360 „ = 9360 Gr.
Einkreuzen 8% = 19968 Meter 749 „
10109 Gr.

Stoff per engl. Pfd. Mk. 3.—
Färben „ „ „ —.20
1 engl. Pfd. Mk. 3.20, daher obige 10109 Gr. Mk. 71.89

Einschuss: 40r Single Weft à 100 Meter 2¼ Gr.
28 Schuss per cm = 280000 Meter = 6300 Gr.
Einkreuzen 2% = 5600 Meter = 126 „ = 6426 Gr.

Stoff per engl. Pfd. Mk. 2.—
Färben „ „ „ —.20
1 engl. Pfd. Mk. 2.20, daher obige 6426 Gr. „ 31.42
Mk. 103.31
Verlust 6 % . . . . . „ 6.20
Mk. 109.51
Fingirter Satz siehe erste Kalkulation 50 % . . . . . „ 54.76
Mk. 164.27
Spesen und Zinsen 10 % . . . . . „ 16.43
Herstellungskosten . . . . . Mk. 180.70

Zu obigem Stück sind erforderlich:

Kette 269568 Meter = 294933 Yards à 560 Yards 1 Zahl = 526¾ Zahlen
Einschuss 285600 „ = 312473 „ à 560 „ 1 „ = 558 „

FIG. 12. A GERMAN ESTIMATE OF COST OF A WORSTED FABRIC AT THE PRESENT TIME. THE ENGLISH STANDARDS ARE MARKED WITH DOTTED LINES.

Instead of saving it makes labor, and if it dispensed with all calculations it would not save much, for, notwithstanding the claim made before the committee on coinage, weights and measures that with the English system "a dreary list of computations must be waded through," such calculations are very simple—by the "straight line" method.

Turning to the estimating of the cost of textiles, we will not stop to compare an English with a pure

the mixed estimate used in the so-calleu metric countries.

Our space and vocabulary are too limited to describe this mixed method, and so at Fig. 12 we show a German estimate of the cost of a worsted cloth, taken from that excellent work by Freidrich Frowein, Kalkulator fuer Artikel der Textilbranche, of which the third edition has recently appeared, and in which the author with an industry and intelligence worthy of the highest praise aims to

simplify the existing chaos of textile calculations for German speaking Europe.

Study this estimate of cost for a few moments, calmly if possible.

The raw material is purchased by the ENGLISH POUND. The finished goods are sold by the FRENCH METER. The yarn counts are ENGLISH, while the length and width of the finished goods are METRIC. The length of the yarn is expressed in METERS, while the counts are ENGLISH, based upon the YARD and the POUND. From this hodgepodge, the weight of the yarn is calculated in GRAMS, which is extended by another arithmetical somersault at a price given in marks per ENGLISH POUND, and to cap the climax the total length of the yarn in METERS is reduced to ENGLISH YARDS and then to ENGLISH skeins of 560 YARDS each!

The picture at Fig. 12 admits of no denial and is but one of many in this work, covering cotton and worsted cloths, corset trimmings, tape, ribbons, elastic fabrics, wool lace, pillow lace, braid, etc., in all of which the same medley of English and metric standards is found.

Such is the chaos of calculations in the textile industry of Europe, causing Lamoitier, the French designer, to utter this lament:—

"We regret extremely these anomalies, which obstruct business, lead to serious errors and wantonly complicate all calculations."

There is no theory here. This estimate is an example of German practice at this moment, and yet men can be found who say that the metric system was adopted in Germany in two years without inconvenience, some asserting they were present when the trick was done; and stranger still, other men can be found who believe it.

We find the English yard and pound to be not only the exclusive textile standard in all English speaking and many other countries, *but also the leading standard in so-called metric countries, of which confirmation is found in the action of the committee of the imperial Reichstag in adopting the English system of yarn numbering in framing the cotton yarn schedules of the new German tariff.*

At the hearing before this committee on the 24th of last June, Herr Muench-Ferber, a delegate to the Reichstag and a manufacturer of cotton and woolen goods, declared that the adoption of the metric standard for yarn numbering would throw the German weaving industry into "ungodly disorder" (heillose Verwirrung).

If that is what the metric system will throw the German industry into today, what would it do for the American textile industry?

Not only is this single English textile standard in use throughout the world, but it is maintained by vast natural forces. Consider what a bulwark for the English system of yarn numbering is the single fact that practically all of the raw cotton grown on earth is sold to the mills by the English pound. Acts of Congress cannot resist such forces, but to be of avail must take them into account.

We may be able to simplify our English textile standards, to apply to them the decimal divisions to a greater extent than at present, to find simpler and more direct methods of calculation than any now used, but a solid front should be presented against the pollution of the leading textile standard of the world with the French meter and gram.

France and Germany give us an object lesson as to what such pollution means. There are not lacking signs that the really practical men in the French and German textile industry are turning from the metric and accepting the English standard as a necessity.

Let us not gaze at the metric stars and neglect to till the English soil.

Jam[illegible] S. Dale

The Latest in English Vestings.

BY S. B. H.

"What do you think of this?" was the question put to me as I had placed in my hands the other day the very latest design in vestings by a Leeds firm of clothiers who have met with great success during the past season. The cloth was as tasty in design and effect as I had ever seen. The firm here who has made the cloth have hit on a new thing, and success has crowned their efforts.

The chief feature of the fabric is the V-shape of the pattern, and the cloth and the vest is known as the "Varsity," Fig. 1. There is nothing whatever difficult by way of construction, the weave and pattern being very simple. There is, however, more than ordinary skill manifest in the arrangement and manipulation of the yarns, and to this feature I desire especially to draw the reader's attention.

The face of the cloth is all worsted black warp, and the back warp is black cotton. The filling is all cotton. The weave of the fabric causes the warp to be thrown onto the face.

Now no vesting is complete without the face having something bright and sparkling to give an effect. Silk has been used until recently, but in this case mercerized cotton is employed; a dissection of the cloth is necessary to determine that the spotting is not made with silk. The mercerized cotton, which lends beauty and effect to the fabric, forms the V in the pattern which comes between the two bold black twills.

This cloth has sold freely here in England at 60 cents (2s. 6d.) per 3/4 yard.

Of course, the tailor makes full use of the design of the cloth, and the second illustration, Fig. 2, shows how the vest should be made up. The whole cloth lends itself to ornamentation of a unique character, and, the price of the fabric being so reasonable, it will form one of the smartest lines for the spring trade of 1903. The ground work of the cloth is black, the mercerized cotton spotting is used in three shades, lavender, red not too fiery, and white. The mercerized cotton is in the filling. I am sending patterns of this fabric to the Boston office of this journal, and they are worthy of being inspected by all interested parties.

Our manufacturers this season have devoted considerable time to the subject of producing fabrics for vestings, and while many designs have been made, still the above is the very latest fabric, and acknowledged to be the smartest cloth. Other designs are to be seen in checks, stripes, squares, dots, etc., but the "V" or "Varsity" pattern is by far the best.

On this side the Atlantic there seems to be a growing tendency to wear vestings in spring and summer, and this season a larger quantity of these fabrics have been turned out by clothiers than in any previous season.

[The illustrations referred to will be found in this issue along with the comparison of English and metric methods of cloth analysis. The results of the analysis are as follows: Warp, 93 threads per inch, finished. Dressed 2 Worsted 2/45s, 1 cotton 2/34s; Filling, 130 threads 2/38s cotton per inch; four filling threads slightly twisted together alternate with one thread, making it possible to weave the 130 filling threads per inch with 52 picks. The finished cloth weighs 13 6/10 ounces per yard 56 inches wide. These weights and sizes are as found in the finished cloth. Each manufacturer must decide upon the sizes to be used "in the grease" to suit his own case.

All but one of the samples received have been used for the comparative analyses. This one can be seen by calling at this office. The fabric is a good example of English skill in making union cloth. Ed.]

Seasonable Fabrics.

Men's Wear Woolens. The advance order business on men's wear light weight woolens and worsteds is now practically over and it is hardly time yet for duplicates to be looked for, although even now original orders are being increased considerably here and there, so that the volume of business is still gradually growing. Sample pieces are now being delivered to manufacturing clothiers, and, notwithstanding the uneasiness that was felt at the opening of the season, there is every indication that much better deliveries will be made than were looked for. Of course, there are some instances where deliveries of sample pieces have been delayed owing to the fact that manufacturers continued to run too long on heavy weights for the present season, but in the majority of cases manufacturers refused heavy weight business which would prevent their devoting early attention to light weights, knowing that only in this way could they give satisfaction to their customers.

The majority of lines of woolen goods are well sold up and fancy worsteds are also in a satisfactory condition. In the fancy worsteds, twist effects seem to have been in the lead and all desirable lines have been sold up and withdrawn.

Since our last writing the lines of the Hockanum Association were opened up at prices which were the same as last season's on the lower grades, but with advances of from 5 to 7 1/2c. and 10c. on the medium and higher grades.

The lines of the Globe Woolen Company have also been opened at prices ranging from the same as last season to 5 per cent. advance on the better goods. Both of these lines have been well received and are already in a well sold up condition.

Prices are being well maintained in all quarters of the market except in a few odd instances where concessions have been made on lines which did not move readily at the opening prices, but such cases as these have had no effect whatever on the general market.

Woolen Dress Goods. With the advance of the season, our predictions with reference to fancy dress goods have been verified and the demand for various lines of fancy weaves is stronger today than for some time in the past. Rough effects of all descriptions are in good demand—zibelines, boucles, clan tartans in heavy weaves and knickerbocker suitings, the last named being, perhaps, the strongest in favor at the present time.

Black and white and blue and white mixtures in heavy rough weaves are picked up as soon as shown and the demand cannot be satisfied. Striped, flaked effects are also much sought after and many looms are being operated on goods of this character. Clan tartans are also increasing in favor and while it is not expected that the demand will continue for any great length of time, it is safe to say that they will be good at least during the fall months. The smaller neat plaids seem to be preferred to the large pattern.

Waistings which were looked upon rather doubtfully by many buyers at the beginning of the season have developed considerable strength and there is every indication that the demand will be as great or even greater than that of last season. White and cream grounds with small, neat figures and stripes in black seem to be preferred. At Fig. 1 is shown a pattern of the Jamestown Worsted Mill's waistings which has been a good seller at 40c. in 27-inch width. This is an all-wool batiste cloth with woven mercerized pattern in black and white.

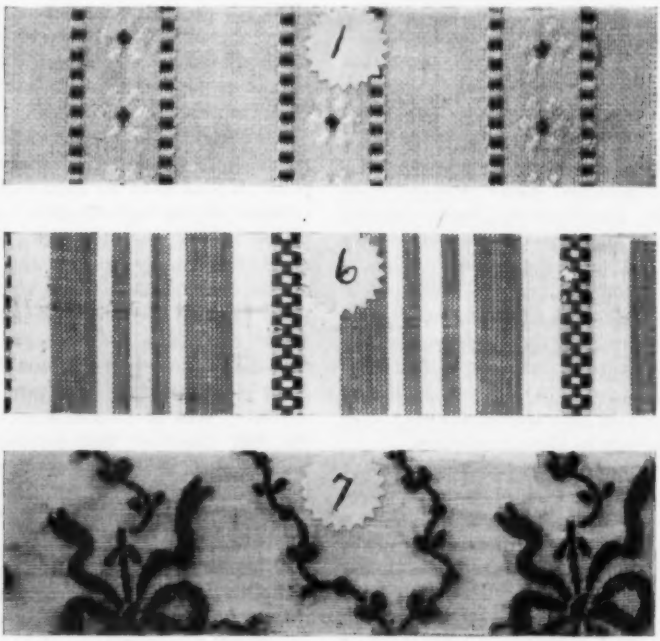
Silks and Velvets. The silk piece goods market is in a very prosperous condition and agents are busy filling duplicate orders on early purchases. Owing to the effects of the silk mills strikes, orders for fall have been considerably behind on delivery, with the

result that very little stock of desirable merchandise has accumulated on the market, consequently prices have been well maintained and a very healthy condition prevails.

Taffetas have been strongly in the lead with a good demand for peau de soie, satin duchesse and other staple weaves. Fancies have also been coming to the front from week to

yard on staple lines of taffetas are contemplated.

Plaids are enjoying a fair share of popularity and many lines of clan tartans are being shown, but this is a style which never lasts for any great length of time and the buyer who dips in too heavily is very liable to be caught with a stock on hand when they drop.



week and more confidence is now shown in this connection than was the case earlier in the season when some buyers seemed afraid to touch anything aside from plain goods, and when fancies were bought they were taken very lightly.

Prices for spring of 1903 are now attracting considerable attention among manufacturers and agents and from present indications it would seem as though higher prices must be made. Manufacturers are generally of the opinion that they cannot maintain the present standard of prices and advances of from 4 to 5c. per

Moire effects are also good and it is expected that a large amount of business will be done on moire velours during the coming fall and winter months.

Little can be said, as yet, with reference to styles for spring and practically no full lines are being shown. There seems to be a tendency in the direction of warp prints, but it has not yet taken any definite shape.

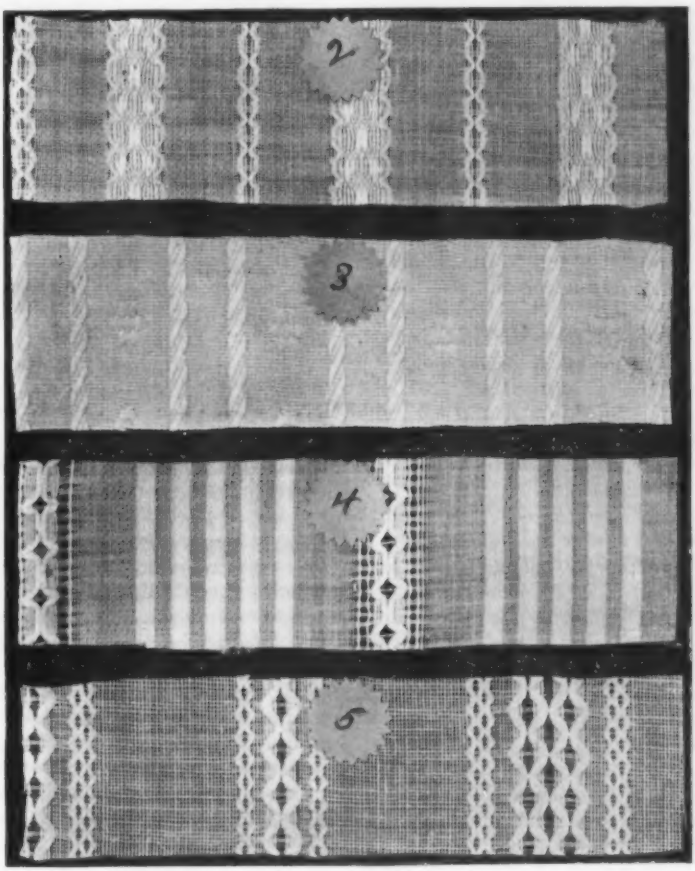
The season has been an exceptionally good one for velvets and there is every indication that the demand will continue strong throughout the fall and winter months. Stocks at the

hands of both retailers and jobbers are unusually low and considerable difficulty is being experienced in procuring supplies. Metallic prints are fairly good while hollow cut cords are very strong and everything points toward a very satisfactory business on all pile fabrics.

practically filled up to the limit of their production.

Open work and leno weaves occupy a prominent position in all of the leading lines, while figured stripes are in good demand and are being taken freely by all large buyers.

In the higher priced goods, brocades



White Goods. The demand for heavy weight white cotton goods for fall selling, has been almost unprecedented and preparations on an enormous scale are being made for the spring season. Many importers are ordering out three and four times their usual quantities of foreign goods while domestic manufacturers are

seem to be in the lead while mercerized fancies of every description are being well taken. In the accompanying illustration are shown some of the best selling styles from the lines of some of the leading domestic manufacturers. Fig. 2 is a style of mercerized fancy stripes sold by Minot, Hooper & Company, at 18c. Fig. 3

represents style No. 113 fancy white madras at 11 1/2c. in 32-inch width from the same concern. The fabric shown at Fig. 4 is Ostrander & Company's No. 720, fancy open work striped muslin at 10 1/2c., 32-inch width, while at Fig. 5 is shown Clarence Whitman & Co.'s No. 1913, lace stripe muslin at 6 1/4c. This last number is a very effective pattern, although in a low priced cloth, and has been one of their good sellers. Organdies and silk mixtures as well as plain sheer goods, such as Persian lawns, batistes, dimities, etc., have also been freely bought and an exceptionally large business is reported.

Cotton Wash Goods. Preparations for the spring season of 1903 are being made on a very liberal scale and a good business is confidently looked forward to. A very satisfactory amount of business has already been booked both by domestic manufacturers and by foreign manufacturers' agents. The price situation on prints and ginghams remains strong, and supplies for immediate selling are very light.

Woven fancy goods of the madras order will occupy a prominent place in the lines of the coming season and goods of this character are being freely ordered. At Fig. 6 is shown one of the new styles of the Sea Island Madras made by the Johnson Manufacturing Co., North Adams, Mass., on which a good business has been done at 10 1/2c. less 10 per cent. and 2 1/2 per cent., in fact, they are practically sold up to February on this fabric now.

Some very handsome designs are being shown in embroidered Swiss goods of a thin, sheer character, and liberal orders have been placed for spring importation. At Fig. 7 is shown a very neat effective bowknot pattern in black on a heliotrope ground, which has been favorably received by large buyers. This number is from the line of Ed. B. Homburger, St. Gall, Switzerland, and is sold at a price which figures 78c. landing cost. A black and white stripe from the same line can be landed at 58c.

Linings. The demand for cotton linings is being well sustained throughout the market and although no quotable price changes have been made, conditions seem to be in favor of the seller and a strong tone is plainly evident. It is reported that advances on staple linings may soon be made, but it is doubtful if sellers will be able to secure better prices, although it is generally admitted that no lower prices need be looked for in the near future.

Kid finished cambrics remain steady at 3 5/8c. for 64s and offers of large quantities at lower prices have been turned down. Mercerized linings in plain and moired effects are the leaders in this division of the market although siliceas and percalines are in steady demand.

The demand from the clothing trade continues steady and is fully up to the average on Italians, cotton Alberts and twills, as well as fancy sleeve linings, but no unusual activity is reported.

Jobbers and retailers complain that their lining business is not fully satisfactory and attribute these conditions to the fact that the business on ladies' ready made suits, coats, etc., is increasing from season to season to the detriment of the retail cloth and lining business, but so far as the manufacturer and converter of linings is concerned the volume of business is not affected in the least as the cutting up trade increases in proportion as the trade with the jobber and retailer falls off.

—Routine is the religion that hast the greatest number of devotees.—Dr. Desprez.

—Everyone wants a friend; few trouble themselves to be one.—E. Deschamps.

—Whoever submits to an outrage, deserves it.—Corneille.

The Knit Goods Situation.

The fact that business on the knit goods market has been slow during the past few weeks does not indicate that there is any stagnation or unusual lack of interest, but is simply due to the fact that practically all of the large buyers have placed their orders on light weight underwear and hosiery for the spring season of 1903, and the season is not yet far enough advanced to bring in duplicate orders.

A backward glance over the season shows very plainly that a satisfactory business has been done and that the resulting situation is all that could be wished for so far as quantities are concerned, although it is true that there seems to be a general opinion that higher prices might have been secured if sellers had acted more judiciously at the opening of the season.

The question of deliveries is now causing some anxiety and it is feared that manufacturers who sold their goods at almost unwarrantably low prices may either try to evade delivery or else deliver inferior merchandise. It will, therefore, behoove the buyer to examine his goods closely when received in order to make sure that the fabrics have not been deteriorated or manipulated in some manner so as to give the manufacturer even a reasonable profit, which he could hardly expect to get considering the prices at which some of the cheaper grades were sold and the condition of the yarn market at the present time.

Considerable attention is already being devoted to the question of heavy weight underwear for fall of 1903, more particularly to fleeces, and rumors are afloat that orders have already been booked at this season's prices, but no confirmation of these reports can be obtained.

It is to be hoped that the position of fleeces in the market today may encourage manufacturers to conduct their business on a different basis during the coming season and thereby avoid the senseless cutting of prices which has been such a prevalent feature of the fleece goods business during the past few years. There is now no question whatever but that the season's production might have been disposed of at much better figures if prices had been uniformly maintained; the cutting of prices once begun, confidence was shaken and each manufacturer seemed to fear that he would be left out in the cold if he did not hammer his prices down to the lowest possible limit.

The conditions today only go to prove that there was ample business for all, and that productions might have been disposed of to much better advantage to all concerned. Although large quantities of fleeces were sold as low as $3.00 per dozen and some lines even at $2,87 1/2, it is impossible today to place orders on any desirable lines at less than $3.25, and extremely difficult to get required deliveries even at that figure.

Women's ribbed fleeced underwear has been in fairly strong demand this season, more particularly throughout the West, and it is expected that a good business on goods of this character will be done during the coming season. One of the popular makes has been a garment which sold at $3.50 per dozen, regular. Flat fleeces for women's wear have never been much of a success owing to their lack of elasticity, but in the ribbed garment this has been overcome to a great extent.

Although, as already noted, there is no confirmation of reports with reference to orders having been already booked on heavy weights, it is generally expected that the opening will be earlier than usual, although no definite information on this point can be given at the present time.

The hosiery market is, if anything, quieter than the underwear division and very little business is being done. Laces still continue to occupy a prominent place for the coming spring reason and embroidered goods, par-

ticularly in men's half hose, are in good demand for immediate delivery. The unusual demand for fleeced hosiery has been a feature of the business during the past few days and has come somewhat as a surprise to manufacturers and agents. The market is firm, but notwithstanding the fact that there is very little merchandise to be had for spot delivery, prices have not been advanced. The hosiery business on wool goods has not been extremely satisfactory, although duplicates are being received from day to day in small volume.

The activity of the Chemnitz market still continues, and notwithstanding the greatly increased production, manufacturers are still far behind on their deliveries. As in the domestic market, lace hose are here also in the greatest request and it is difficult to find any goods for spot delivery. The tendency toward fine, thin, gauzy goods is very noticeable not only in the lace effects but also in plain cottons and lisles. Split feet are difficult to procure and inferior qualities are being bought at the same prices which were paid for higher grades last season. Black and white effects in small figures and stripes will be popular for the coming spring season and the ecru or linen shades are also looked upon with considerable favor.

The knitted golf vest which was in such strong demand last season promises to be a good seller this season as well, and many extensive lines are being shown in which some improvements are noted not only in the matter of weaves, but also in improved styles and finish. Out of the original golf jacket the makers have evolved a very useful and handsome garment in a blouse effect which is full of style and dash and is in very strong favor just at the present moment. These garments are made in various fancy weaves and color combinations, as well as plain, solid colors, buttoned down the front and with roll collar and turnback cuffs. Fig. 1 represents a very neat and effective style of golf jacket, while at Fig. 2 is shown one of the all-wool blouse effect sweaters referred to above.

—The timid man boasts of being prudent; the miser, of being economical.—Sterne.

—One should laugh before being happy, for fear of dying before having laughed.—La Bruyere.

Meeting of the New England Cotton Manufacturers' Association.

AT NEW YORK CITY, SEPT. 30, OCT. 2, 1902.

The seventy-third semi-annual meeting of this association was held at the rooms of the Society of Mechanical Engineers, 12 West 33d St., New York City, and the opening session was called to order by Secretary C. J. H. Woodbury at 8.15 P. M. Tuesday, Sept. 30.

In his opening address, President Chas. H. Fish strongly urged that the name of the association be changed to The American Cotton Manufacturers' Association, and it seems probable that this will be adopted as the work of the organization has spread out far beyond the limits of New England.

PRESIDENT'S ADDRESS.

Charles H. Fish, Dover, N. H.

Gentlemen of the New England Cotton Manufacturers' Association:

For the first time in the history of this Association, we meet, in convention, in this, the greatest and most important city of our country, the one city wherewith each and every company, corporation or private individual here represented has direct business connections or affiliations, and within whose boundaries is daily transacted by far the greater part of the important business affairs governing in a large degree the transactions, not to say the welfare, of the cotton manufacturers of America.

It seems not only eminently fitting then that we should at last have chosen this location for our meeting, but also that we should find here, as we do, a welcome from the great organization, The New York Cotton Exchange, which is so important a factor in the question pertaining to our raw material and which is responsible to such an extent for the joys or sorrows of the annual make-up.

Beyond this, it is a distinguished honor to be permitted to assemble as the guests of the great American Society of Mechanical Engineers, in acceptance of its hospitable invitation to hold our Seventy-third Meeting in this building.

Every cotton manufacturer, no matter whether his knowledge has come to him through theoretical channels or through the hard knocks of a personal experience, or by both, he is, at least in a way, an engineer, although he may not have assumed the title of the honorable profession. A cotton manufacturer must be responsible for engineering work in various degrees, from making the detail design and managing the construction, to the approval of the plans of others, for which he generally furnishes the inspiration. He must supervise the development of water powers, the building of dams, the installation of prime movers, whether by water or steam, the erection and equipment of mills, oftentimes in locations where the foundations require the exercise of the highest degree of skill, the organization of textile machine plants, the transmission of power, whether by belts or electricity, the erection of works for lighting, both by gas and electricity, and furthermore, conduct operations and attend to the maintenance of these numerous varieties of mechanisms, and provide against the depreciation by wear and tear and the greater losses due to subsequent invention.

To properly attend to these various duties may be unequal to the thoroughness expected of a specialist, but I maintain that it does constitute an engineer. But this is not merely an expression of individual opinion, for many years ago when the American Society of Mechanical Engineers received the proposition for membership of an agent of a cotton mill, the Council of that organization made an exhaustive investigation into the duties of the manager of a cotton mill and fixed the precedent, which resulted in the election to membership of many who are also members of the New England Cotton Manufacturers'

Association, and several of these have been further honored by election as officers of the American Society of Mechanical Engineers.

If ever a man understood the dynamics of liquid and reduced his knowledge to practical application, it was Henry R. Worthington, whose portrait graces these walls. In reply to the question as to whether he called himself a mechanical or civil engineer, Mr. Worthington stated that it was his ambition to be called a Pump Builder.

We are beginning to realize that engineering is one of the most important foundation stones of our success, and we should receive inspiration from our surroundings, from this auditorium, within whose walls have been heard the voices of the most able engineers, the most astute mathematicians and the most successful business gentlemen the world has ever produced.

Briefly, I would call your attention to one or two matters of interest, which I believe deserve your consideration before this convention closes.

This Association was organized thirty-seven years ago, as the successor of a small local society of manufacturers, because the conditions required a larger field, and when it was incorporated in 1894, it availed itself of the opportunity of re-phrasing its constitution and by-laws and broadened its scope to meet the conditions as they have existed since that time, and it is now believed that the purpose of this organization would better set forth, if, in place of the old title, dear to us all but which indicates a limitation that does not exist in this organization, a new name is adopted, and at this meeting a notice will be given of an amendment to be offered at the Spring Meeting, changing the title from the New England to the American.

I firmly believe that the time has come when we should, without departing from the present policy of the organization as stated in the constitution and by-laws and while maintaining the old standard, take for our Association a new name, indicating the universal or the national character of our work and our interest, removing the limitations which our present name suggests.

I would refer to another matter, which seems to me to be of interest and importance. At previous meetings of the Association, numerous and valuable papers have been submitted upon important questions pertaining to the various methods of ascertaining the cost of manufacturing. These have all been valuable contributions, but there is a collateral phase of the subject which deserves further or more serious consideration. I would suggest that this Association, following the precedent of other technical and commercial organizations, where valuable contributions have been made as to the unification of the methods of keeping accounts, should consider at this meeting the importance of appointing a committee to present at some future meeting a report upon a standard method of keeping our mill accounts.

I would call your attention to the badge which you wear at this convention, upon which is represented in miniature a bale of cotton. You will observe that the design is taken from the ordinary bale, or what is known as the Commercial Cotton Bale. This might be considered as bringing before us again the interesting and important question of the baling of cotton. As you know, this Association, in carrying out one of its fundamental principles, has from the first been keenly alive to everything pertaining to the essential questions of improving the condition of the cotton as delivered to the mill. These questions have included the presentations of matters pertaining to the betterment of the cotton fibre by cultivation and hybridization, as well as improvements in the care of ginning, baling

and transportation. By invitation of the Board of Government, there has been presented at previous meetings, several papers, treating exclusively upon the baling of cotton by new methods. Whatever may be the merits of these radical departures in baling cotton, it is to be noted that the commercial bale is substantially the form as invented by Judge Simon Gratz of Missouri about a century ago; while cotton was covered with bagging in Kentucky by Nathan Burroughs, in 1796, and this is still practically the only one in which the cotton is officially quoted on the market or delivered to the mills today.

It may be of interest in this connection, to state that an investigation in some old bill of lading books has shown that previous to 1817 cotton averaged 225 pounds per package, and after that the average weight increased to 298 pounds, while the average of the commercial bale of today is about 500 pounds.

Some old records in New York City indicate that the first mention of the export of cotton from this country occurred in 1739, when a sample was sent to England by a planter from Georgia, and in 1747 several bags of cotton valued at 3 pounds, 11 shillings, 5 pence, sterling, were exported from Charleston, S. C., and ten years later Liverpool records mention the arrival of cotton from Charleston, S. C., and in 1770 three bales of cotton were shipped to Liverpool from New York, ten bales from Charleston, and four bales from Virginia and Maryland, and also three barrels from North Carolina.

In 1793 bales of cotton are referred to, and it was during this year that the application of the Whitney Cotton Gin initiated the commercial development of cotton, as an article of extensive commerce.

Again in this connection, I would state that during the past year the Board of Government, deviating from its usual practice, appointed a committee of two members, to attend a fire test of cotton bales, under the auspices of the National Fire Protection Association, and we expect that the report of this committee will be submitted at this meeting. This report will be interesting as bearing upon this subject of the damageability of cotton by fire under the various methods of packing in comparison with the commercial cotton bale.

It is not my intention to take up the time in unnecessary review or suggestions. The matters pertaining to the Association are, I believe, well in hand, and I am pleased to report a satisfactory increase in membership and a marked improvement in the interest shown in the Association and its work.

I wish to extend to you, gentlemen of the Association and guests, a warm welcome to this the seventy-third convention, and I sincerely trust that the proceedings at the sessions will prove interesting, aside from giving valuable information, and I hope also that you may all find sufficient time to avail yourselves of the many recreations which this location affords. I am sure you will pardon me for calling your attention to the fact that we are here primarily for business, if at the same time I impress upon you the importance of enjoying yourselves as you have the opportunity, and as I have no doubt you all deserve.

James M. Dodge of Nicetown, Pa., Vice-President of the National Association of Mechanical Engineers, welcomed the visitors in a brief address, in behalf of his society, after which representatives of the New York Cotton Exchange addressed the association.

J. Temple Gwathney, as the first speaker, welcomed the members in behalf of the Exchange. He was followed by Samuel T. Hubbard, ex-vice-president of the Cotton Exchange, whose address before the association at its last meeting in Boston will be

long remembered by those who heard it, on account of the valuable and practical advice which he then gave.

James F. Maury followed Mr. Hubbard and spoke of the cotton statistics and the government cotton estimates. He criticised the government methods severely and the sentiments he expressed were vigorously applauded by his hearers. Mr. Maury's plan is to have special expert agents travel over the cotton fields and report what they see instead of what they are told.

The next speaker, Walter T. Miller, spoke still more strongly on the same question and declared his belief that the cotton crop reports were purposely made incorrect to serve the purposes of speculators by those who supplied the information to the government.

L. L. Fleming spoke upon the transportation problem and pointed out that important concessions had recently been made to the local market by the railroad companies.

At the second session on Wednesday morning, the first paper was by William F. Parish, Jr., on Lubrication of Textile Mills. He considered cylinder oils, engine lubrication, dynamo oil, and lubrication of heavy and light machinery, shafting, looms, spindles and dyehouse machinery. This paper was listened to with close attention and was followed by Observations on Spindle Banding, a paper by William D. Hartshorne of Lawrence, Mass. The writer considered the subject in detail and illustrated it with charts showing the results of practical tests.

An interesting paper upon the World's Supply and Consumption of Cotton, was read by S. N. D. North, Superintendent Dept. Manufactures, United States Census. He gave an account of the plan and purpose of the cotton ginning investigation and outlined the advantages a new system of collecting statistics at the ginneries would have.

The next paper was on the Preparation of Cotton for Carding and Spinning; Especially Egyptian Cotton, by J. J. Connell, Lowell, Mass.

Cotton should be opened and mixed in large quantities, the larger the better, and should stand open at least three days, and more if possible, before using; by so doing you can get better and cleaner carding, more even numbers and better spinning than by using cotton right from the bale. Egyptian cotton should never be put in the feeder until it has been opened, or mixed, several days in a dry room. All kinds of cotton can be made at least one-half grade better by properly mixing and airing before using.

When cotton is properly aired and loosened in the bins, the openers and lappers will take out more dirt and leaf and give cleaner yarn than it will when run from the bale. On 40-inch machines, I would run as follows:

Opener lap 10 oz. per yard,
Intermediate lap 11 oz. per yard,
Finisher lap 12 oz. per yard,

having the same number of openers, intermediates and finishers, arrange the speed of feed so as to get the same number of pounds through each machine. I consider 10,000 pounds per week a good production for a machine on ordinary work up to No. 40 yarn.

Most of us pay too little attention to the picker room, but if the best results are to be obtained, we must give it personal attention once in a while.

It is useless to go into detail on the subject of carding, and I will only say that the 40-inch revolving flat card is the most popular and I believe it is the best. If you strip and oil them, clothe them tight, keep a good edge and set them right, you will never have any trouble with them, but I would like to know the results if every manager would go into his mill and weigh the sliver from twenty or more cards, as they are running and note the variation; I firmly believe most of you would be surprised, and I hope some one will suggest a way to get an even sliver.

Drawing is a most important point

in a mill, to get even, smooth yarn; I believe in as many doublings as can be afforded, and at least three processes of drawing, and six into one on each head.

The first twist in the work is put into the slubbing. I would have as short draft as possible, and be sure to put in twist enough in order not to strain it in the creels.

Having a doubling at the intermediate we can run a good draft, and should get very even work to go to the fine frames, or second intermediates, if we run four process work.

Good roving is hard to get, and there being so many different ideas and so many different conditions, it is hard to fix a standard to go by, and lots of good work is spoiled in the roving frames. However, I think more can be gained by discussing this question than by listening to a long paper.

EGYPTIAN COTTON.

To begin with, I would like to ask if there is any specified rule for grading and sampling Egyptian cotton. Brown Egyptian is long staple and good quality; it is fine and silky, the diameter of fibres is very even, but the length is very uneven, in fact, all Egyptian cotton which I have seen, has more short, undeveloped fibres than any other kind of cotton used.

Brown Egyptian cotton is a very nice cotton to run, and for soft twist hosiery is superior to any other kind; it cleans easily and runs well on every process, if the machinery is not overloaded.

Egyptian cotton requires about 10 per cent. more twist than American cotton of the same length of staple to get the same strength.

I believe in trying to raise our Northern mills to a higher and better class of goods, leaving the cheaper and lower grades to our Southern friends who are making a good showing in this business.

The first paper read at the evening session of Wednesday was on Our Foreign Commerce in Cotton Goods, by O. P. Austin, Chief Bureau Statistics, Treasury Department.

Although dealing with dry statistics, the speaker presented a great deal of valuable information in a very attractive way. By the graphic charts which appear on another page, he showed the movement of cotton and cotton goods with dry statistics, the speaker presented a great deal of valuable information in a very attractive way. By the graphic charts which appear on another page, he showed the movement of cotton and cotton goods throughout the world. He said in part:

The fact which has most impressed me in the study of these figures is that practically all of the manufactured cotton goods are now exported from countries which produce no cotton. The total exports of cotton cloths amount to 400 million dollars, and of this 365 millions, a million dollars a day, is sent from Europe, which produces no cotton, and but 26 million dollars worth from the country which produces three-fourths of the cotton of the world—the United States. Of the 127 million dollars' worth of miscellaneous cotton manufactures exported, 120 million dollars' worth is from Europe and but six millions from the United States. Of the 100 million dollars' worth of yarn, 58 millions are from Europe, 10 millions from Japan, which produces no cotton of consequence, 30 millions from India, and none from the United States. Thus, of the 625 million dollars' worth of cotton manufactures entering into international commerce, 544 millions is from Europe, which imports all of the cotton which it utilizes in this manufacture, and only 31 millions from the country which produces about three-fourths of the cotton of the world, the United States.

The next paper was entitled Mill Construction on Continuous Skeleton System, by Sanford E. Loring, Syracuse, N. Y. An animated discussion followed in which Mr. Loring was

found fully able to maintain the position he had taken.

A paper entitled Bleaching and Finishing of Textile Fabrics, was then read by A. C. Freeman, New York City.

In the sizing of yarns for piece goods, the question of whether this or that material entering into its composition will be of advantage or otherwise in the bleaching and finishing, is rarely, if ever, considered by the manufacturer.

As long as he can get his warps through the weave room and into cloth with the minimum amount of trouble and expense his interests end there.

The bleaching, finishing and putting the goods into proper condition for the market are duties which do not concern him, and whatever difficulties arise later the finisher is expected to solve for his own salvation.

Of late, bleachers have experienced much trouble in getting out pure goods. In fact complaints in this direction appear to be very general, even the dyers of piece goods in some instances are experiencing their share of the trouble, in being unable to get cotton piece goods dyed evenly.

A close study has developed one cause, which, while it may not be the only one, is in itself certain to produce a serious defect in any piece of cotton

Fig. 1.

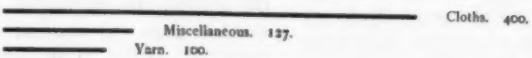


Fig. 2.

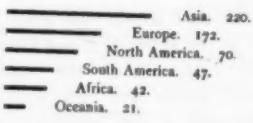


Fig. 3.

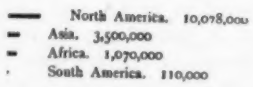


Fig. 7

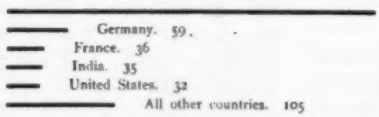


Fig. 5

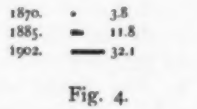


Fig. 4.

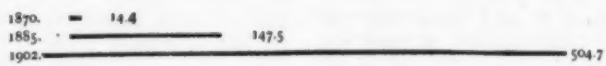


Fig. 6.

Fig. 1. Exports of Cotton Manufactures in 1901, by Grand Divisions. (In millions of dollars.)

Fig. 2. Share which Cloths, Yarns and Miscellaneous Goods formed, respectively, of the Total Exportation of Cotton Manufactures of the World in 1901. (In millions of dollars.)

Fig. 3. Recorded Imports of Cotton Manufactures in 1901 by Grand Divisions. (In millions of dollars.)

Fig. 4. Exports of Cotton Manufactures from the United States, 1870, 1885, 1902. (In millions of dollars.)

Fig. 5. World's Exports of Cotton Manufactures in 1901, by Principal Countries (In millions of dollars.)

Fig. 6. Exports of Cotton Cloths from the United States, 1870, 1885, 1902. (In millions of yards.)

Fig. 7. Production of Cotton by Grand Divisions. (In bales of 500 pounds.)

FOREIGN COMMERCE IN COTTON GOODS.

goods, viz: the use of paraffine and similar substances in connection with the sizing of warps.

Years ago paraffine was brought to the notice of manufacturers and was adopted by many mills, as its use improved the weaving qualities of warps. Almost immediately a huge wave of misfortune began to roll in. First came mildewed grey goods, for the simple reason that where paraffine is used in warp size, it simply remains therein in the form of an emulsion, so that when the warp is saturated with the sizing material the moisture penetrates the same, but the paraffine remains on the outside. In drying the moisture cannot get out, although the warp appears dry, as paraffine hardens at quite a high temperature, but in a short time the absorbed moisture generates mildew.

Next came the bleacher's inability to get pure goods, as paraffine is a peculiar article, and will not dissolve in any of the chemicals that are used in the process of bleaching.

Paraffine is insoluble in water, but soluble to some extent in boiling alcohol, in ether, oil of turpentine, oil of olives, benzol, chloroform and sulphide of carbon. Acids, alkalies and chlorine not acting upon it at ordinary temperatures, consequently it cannot be removed entirely from cotton piece goods by processes that are practical and safe, and wherever the cotton fibre is coated with it, the bleaching chemicals are resisted, so resulting in impure goods.

The dyer found his pieces uneven from the same cause. In boiling off, he simply spread the paraffine on to the filling, and wherever it remained, had spots of a lighter shade after the dyeing process; as his dye liquor could not penetrate through a material which resisted it.

These results caused paraffine to be discarded in a very decided manner and it is to be regretted that it has appeared again.

Frank P. Vogl, Claremont, N. H., next read a paper on the Card System in Mill Supply Accounts, and showed a card index that he had used for this purpose for a long time.

At the Thursday morning session William E. Winchester, Philadelphia, Pa., read a paper on Tension on Roving Frames.

The next paper, entitled The Under-Feed Stoker, was by George C. Tewksbury, Boston, Mass. He did not attempt to give a technical description of the under-feed stoker, but confined himself to a history of its development and statement of facts that his experience with the apparatus had established. In conclusion he said:

Properly operated the system represents a gas producer and gas consumer in one furnace. The green fuel being introduced from the under side of the furnace proper, the incandescent fuel resting thereon must necessarily liberate the volatile matter in the green fuel. Air being introduced at the point where gases are being liberated—this point being underneath the mass of incandescent fuel—a thorough mixture of the air and gases at a high temperature is certain to be obtained.

This combustible mixture must pass upward through the body of incandescent fuel and must be consumed. The result is the utilization of practically all of the heat producing elements in the fuel, making more nearly perfect combustion than can be obtained in any other way; and thereby ensuring freedom from smoke.

With an under-feed stoker properly installed, and with a proper air equipment, it is possible to obtain a greater boiler capacity than can be obtained by any other system, because of the fact that a proper distribution of coal and air is always maintained, and in any furnace properly equipped the two elements can be supplied in any quantity.

From the writer's experience he believes that an hourly fuel consumption of about 1,000 pounds of coal is as great as should be attempted with one under-feed stoker. Attempts have

been made by manufacturers of underfeed stokers to increase the fuel consumption above named, but in the main they have not been, and in the writer's opinion, cannot be successful with all classes of coal. When greater fuel consumption is desired in any one furnace, two or more stokers should be used.

The writer believes that an underfeed stoker properly installed and properly operated can be operated with much less expense for repairs than any other stoker because of the extreme simplicity of same.

Chas. W. Dennett of North Adams, Mass., read a paper on the Management of Mills which was listened to with close attention.

At the Thursday evening session the election of members resulted as follows:

Active Members.—G. H. T. Babbitt, assistant superintendent Chicopee Manufacturing Company, Chicopee Falls, Mass.; V. T. Barber, superintendent Slater Cotton Company, Pawtucket, R. I.; A. E. Bosworth, superintendent Bernon Mills, Georgiaville, R. I.; S. Parker Bremer, treasurer Monadnock Mills, 264 Winthrop square, Boston; Halsey Connett, superintendent Clark Mile End Spool Cotton Company, East Newark, N. J.; O. D. Drew, superintendent Peabody Manufacturing Co., Newburyport, Mass.; Jas. B. Duggan, president Union Bleaching & Finishing Company, 41 Jewett place, Utica, N. Y.; Louis I. Guion, superintendent Columbia Duck Mills, Columbia, S. C.; Joseph B. Jamieson, manager Boston office of New England Cotton Yarn Company, 77 Bedford street, Boston, Mass.; Arthur H. Mason, treasurer Barnaby Manufacturing Company, Fall River, Mass.; Albert E. McDonald, agent and general manager C. P. Jackson & Bro., Lawrenceville, Ga.; James A. McLane, superintendent Davis Mills, Fall River, Mass.; Joseph Merriam, president Springfield Webbing Company, Middletown, Conn.; Pardon B. Sanford, superintendent Utica Spinning Company, Utica, N. Y.; R. Irving Tobey, manager Cold Spring Bleaching & Finishing Works, Yardley, Pa.; M. J. Toohey, manufacturing rope, twine and banding, Fall River, Mass.

Associate Members. — Albert Birch, manufacturer of textile machinery, Somerville, Mass.; Edmund E. Blake, selling agent Saco & Pettee Machine Shops, Newton Upper Falls, Mass.; Melvin H. Coffin, selling agent Whitin Machine Works, Whitinsville, Mass.; William Dresser Edwards, New England representative Buffalo Forge Company, Southbridge, Mass.; Joseph Fossel, cotton machinery expert, 152 Congress street, Boston, Mass.; Walter Maxwell Hastings, principal textile department American School of Correspondence, 156 Tremont street, Boston, Mass.; Theodore H. Price, cotton dealer, 71 Wall street, New York, N. Y.; Arthur Trumbull, manager John J. Keller & Co. (Incorporated), 56 South Water street, Providence, R. I.

William P. Wilson, Sc. D., Director of Philadelphia Commercial Museum, read a paper on Exports of Cotton Goods which was replete with valuable information.

The next paper, entitled Cotton Mill Expansion, was by Arnold B. Sanford, Boston, Mass.:—

Our topic, cotton mill expansion, confines us to cotton manufacturing, which brings us immediately to industrial evolution, which simply means economic development in modern business.

In order to treat this subject intelligently and concisely, we will range it under several heads.

NEW METHODS.

The problem constantly before the cotton manufacturer from early morning until night is, how to increase production and reduce his costs, and if he should live to be as old as Methusaleh and keep in the mill business, he cannot solve the problem, which will keep him figuring until the last day he is in service, and when he steps out someone else will take it up where he left off.

Remember the world moves, competition is growing keener every day and we cannot afford to ignore anything which offers economy over present methods—the progressive mill man will always lend a willing ear to anyone, who can show him a saving over what he is now doing.

A remarkable event has recently taken place, I refer to the visit of the members of the Textile Manufacturers' Association of Lancashire, England, to inspect and investigate our cotton mills. Fifty years ago we were scarcely known in this industry, England practically controlled the business of the world. These gentlemen came here to look us over, and find that we have grown more than they conceived or dreamed of. They know very well that we are reaching out for their markets, which they have controlled for so long a time.

They found one factor here worthy of notice and serious consideration;

we refer to the Draper Company's wonderful loom, the Northrop, and we understand as a result of that visit an order has been placed for 500 to be shipped abroad. The Drapers, with their characteristic business sagacity, have made the most of the impression and have hastened across the seas; it is now announced a strong company has been formed with the Drapers interested to equip a large plant in England for the manufacture of these celebrated looms. This we consider a great triumph for our American inventors, and the Draper Company are to be congratulated for their success in developing this marvelous piece of machinery and overcoming almost insurmountable obstacles in perfecting and introducing same.

Following upon this we are on the eve of higher speeds for all kinds of machinery which goes toward the equipment of the mill plant, from the picker room to the finished product or last process. The rotary spinning ring has been attracting our attention for high speeds in spinning. Now we hear of the Marshall patent spinning frame. One of these has been placed in a Fall River mill. The inventor claims it has improved supports for the rotary rings and a new arrangement for oiling, the aim being high speeds with slight friction, and also more even spun yarns. He claims an increase of 33 1/3 per cent. in production on our present spinning frames.

To show the wonderful strides in invention, I call your attention to the controller on the electric car. If you have never noticed this and will take the trouble to do so, you will find on examination of same that it has cast upon its face a record of thirteen patents, the first bearing date August 14, 1883, and the thirteenth, March 26, 1895.

This in itself is an object lesson of the wonderful progress in mechanics and inventions. Suppose the General Electric Company had been satisfied with controlling this patent for the first four or five issues and shown no more interest, feeling secure, you can imagine what would have been the result! Some one else would have controlled a better invention today instead of the General Electric Company.

So I contend that the successful mill manager of today must be keen to look into and consider any invention or improvement to make better work and more of it at a cheaper cost of production. If he has not the time to give to those who are making it possible for him to achieve this result, then, in my opinion, he is a back number and a hindrance for the success of the company which employs him and the days of his usefulness are numbered.

The successful mill superintendent in the near future will be the product of our textile schools. The old method of learning the business through a series of many years of practical experience fitting a man for a mill superintendent, and not giving him the position until he has reached the age of forty or fifty years, are passing. The textile training school now steps in, and offers to the young man a three years' scientific course, and when that is completed, if he will then go into the cotton mill and apply his theoretical education to the practical end of the business, say for five years more, we will then have a well equipped, wide-awake mill superintendent of say thirty years of age, full of life and energy, ready for the work, and I think that most of us would prefer for a manager the younger man thus equipped.

Industrial textile training in the cotton industry and practical experience in the mill will in the future go hand in hand, and turn out the best mill superintendents for the larger mills, as the trend of the times in cotton milling is concentration under one management of a great number of spindles, requiring well educated and practical, experienced managers. The textile schools should receive the cordial support of every one who is in

any way connected with the cotton mill business, and I claim in the future they will be a great factor in the school of evolution for developing our cotton industry.

Here we come to a decided change in the management of the business. There is no denying the fact that the days of small cotton mills are being rapidly numbered, and they will surely be supplanted by the mammoth mills of the future. We only have to glance backward fifty years and see how we started in New England with small mills of 2,000 to 5,000 spindles, and ask where are they today? You look for them and in their place stand the immense plants of Lowell, Lawrence, Fall River and New Bedford, and other towns in the states of Massachusetts, New Hampshire, Rhode Island, Connecticut and Maine.

The Southern States commenced the business in the same way as New England, and today you hear of large mills in the South. Old corporations are now adding to their present capacity, doubling and trebling, all for what? To increase production and minimize cost. Competition is behind all of this driving us to produce goods at the lowest possible figures. It is the survival of the fittest.

We hear you say at this point: Has the cotton industry been expanded beyond a healthy basis? and we answer frankly, yes, in some directions. Too many mills making the same kind of goods have been built; especially is this true of the Southern States. When a cotton mill is to be built, the projectors thereof should consider most seriously what kind of a mill to build and if the trade conditions fully warrant its construction, and if its production will command a ready sale at fair margins of profit. When sure of these very vital and essential factors for its success, then with good management and enough working capital such a mill should prove a success and not a hindrance to others in the business.

The danger has been in the South of too much competition among themselves, and rather too rapid expansion along the same lines. No one for a moment can take the position that cotton mill expansion in the United States has reached its zenith. What we want to do for our success in the future is to expand along the right lines, and build our mills on the legitimate demands of the increase from the trade. Our natural advantages cannot be surpassed for climate and growing our own cotton.

We wish to call especial attention at this time to the growth of the industry, both in the New England and the Southern States, having carefully compiled the following table of statistics, which I trust will be of interest to you, and which shows the remarkable development of the cotton industry during the last fifty years:—

FIFTY YEARS' GROWTH.

New England.		Southern States.	
1840,	1,597,400	1840,	180,000
1850,	1,800,000	1850,	230,000
1860,	3,859,000	1860,	298,000
1870,	5,498,300	1870,	327,000
1880,	8,642,100	1880,	1,554,000
1890,	10,836,200	1890,	3,670,800
1900,	13,750,000	1900,	5,250,000
1902,	14,000,000	1902,	6,750,000

Total for New England, Southern and Middle States, estimated 23,000,000.

When you take into consideration the capacity of the Southern mills, many of them running night and day, the number of spindles do not fairly represent the output of the production, for it is safe to say that 33 1/3 per cent. of the southern mills run night and day. This is especially true of the cotton yarn spinning industry.

In connection with the above table, I wish to call your attention to the following textile consumption of fabrics: a complete revolution has taken place. Statistics show that in the year 1800 more flax goods were used than either wool or cotton. Flax has now dropped to the third place, the amount now consumed of flax is barely double that of 100 years ago. Wool has increased during that time five fold and cotton has increased 39 fold, and there

is today three times as much cotton goods used as woolen and seven times more than linen.

To expand our cotton industry and make the United States the largest producer, and get the business down to a basis where we can defy competition, there are still some very important matters necessary to be accomplished. We refer to trade treaties with foreign countries in whose markets we desire to sell our productions. Proper trade treaties should be speedily arranged with foreign countries on a mutual basis of give and take. Remember also that if you don't buy, you cannot sell, and if we want to sell our productions to our foreign customers, we must buy of them and let their goods, such as they want to sell us, come into our country upon liberal concessions.

Another important factor is transportation, our cotton manufacturers need the benefit of the lowest cost in transporting their goods to these foreign countries, and our manufacturers and merchants should make a special effort to obtain the lowest cost on transportation of their merchandise. We have much to learn yet for the requirements of our foreign customers, whose markets we are seeking to furnish with cotton goods and yarns. We must learn how they want their goods prepared, also the terms upon which they buy and trade. We must conform to their customs and not try to force our system upon them.

When we have succeeded in getting our cotton mill business down to a solid basis of competition, where we can compete with England or any other foreign country in the cost of production, and then having for our aids proper trade treaties with these foreign countries, besides proper transportation facilities and carry our goods in American vessels, then we shall see much greater expansion, and in all probability the United States will lead, in the near future, all other countries engaged in cotton manufacturing.

The meeting closed with a Report of the Committee on Pure Test of Cotton Bales. A gratifying feature of the sessions was the general discussion that followed nearly all of the papers.

Hand Painted Hosiery.

In addition to the many novelties in hosiery produced by printing designs on the fabric, hand painted decorations have recently become very fashionable. The best of these fabrics are of French manufacture.

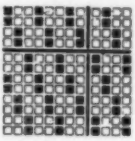
Usually, the design takes the form of a copy of some well known painting, which is usually selected by the purchaser of the hosiery. The price for such sketches varies from $100 to $300 per pair. Recently a pair of ladies' hose decorated with jewels was sold for $1,000. The great bulk of the goods found in stock in the stores are decorated with representations of birds and flowers. The highest price for these is $50, the lowest about $15.

The goods are treated with a special preparation before being painted to make them washable. The most popular style have a figure of the god of love surrounded by flowers, birds and fancy scroll work of all kinds. The decorations extend from the top of the stocking to the foot. For black hosiery, autumn leaves and foliage are preferred.—Deutsche Wirker Zeitung.

A Technical Lexicon. The German Engineering Society, one of the leading associations of its kind in the world, has undertaken the compilation of a polyglot technical lexicon in English, French and German. The work has been in progress for nearly two years and it is expected that it will not be finished for several years to come. The enterprise is backed by ample capital and the best technical talent. The intention is to have the lexicon cover all branches of industry, science and art, and special at-

tention is being paid to the textile branches.

To make the lexicon complete, it is necessary that everyone familiar with technical terms in any of these three languages should assist, and the society, through its editor, Dr. Jansen, extends a general invitation to everyone interested to communicate with him. The work will be of great value to the three leading nations of the world and we urge any of our readers who can aid it to address Dr. Hubert Jansen, Editor, Technolexikon, Berlin (N. W. 7) Dorotheenstrasse 49.



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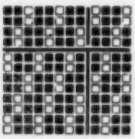

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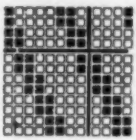

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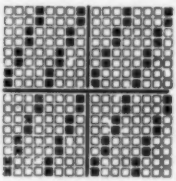

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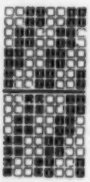

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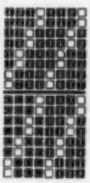

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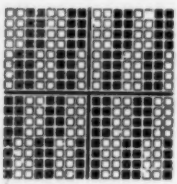

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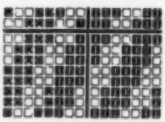

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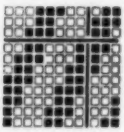

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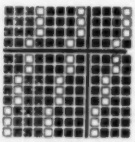

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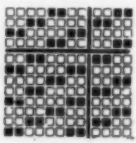

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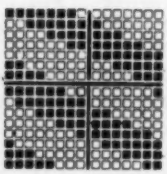

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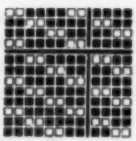

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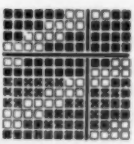

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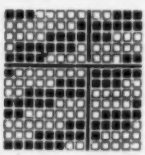

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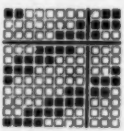


Fig. 159.

A Guide to Weaving.

BY IVO KASTANEK.

IV.

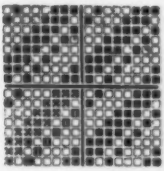
(Copyrighted, 1902, by Guild & Lord.)

STEEP TWILLS.

If more than one pick is woven in each shed of a 45° twill, a steep twill, or one having an angle greater than 45°, is formed. The steepness of the twill increases with the number of picks in a shed.

Twills with two picks in a shed, Figs. 144 to 150, cover twice as many filling as warp threads; with three picks in a shed, Fig. 152, three times as many; with four picks in a shed, Fig. 153, four times as many, etc.

There are steep twills, however, that cover the same number of threads in warp and filling, Fig. 151. They are formed by first deciding upon the number of picks in the filling pattern and then laying out the weave so that the same number of warp threads will include two or more twills as desired. Such twills have an



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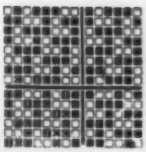


Fig. 161.

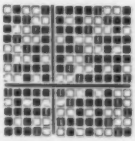


Fig. 162.

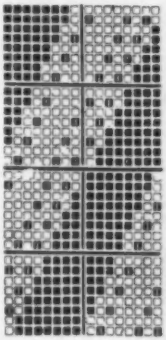


Fig. 163.

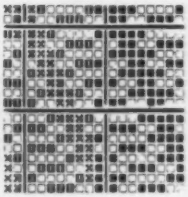
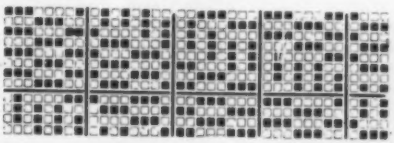


Fig. 164.



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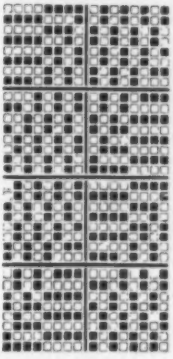

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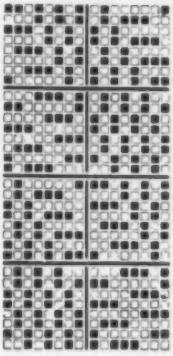


Fig. 203.

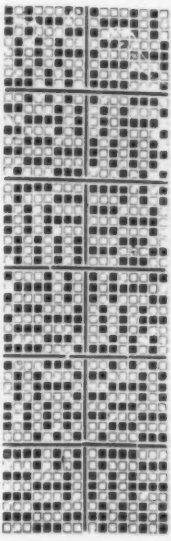


Fig. 204.

odd number of threads in warp and filling patterns.

Steep twills can also be made by setting the warp closer than the filling.

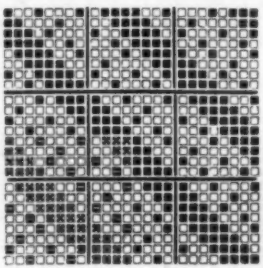


Fig. 165.

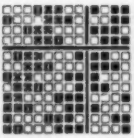


Fig. 166.

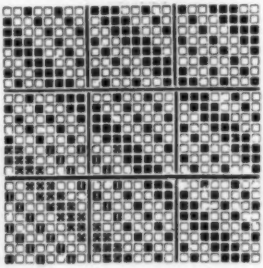


Fig. 167.

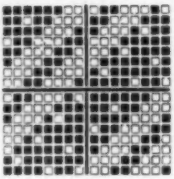


Fig. 168.

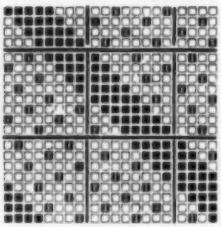


Fig. 169.

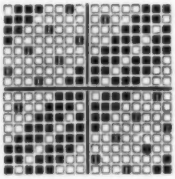
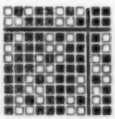


Fig. 170.



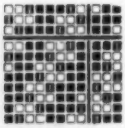


Fig. 171. Fig. 172. Fig. 173.

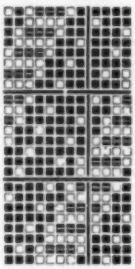


Fig. 174

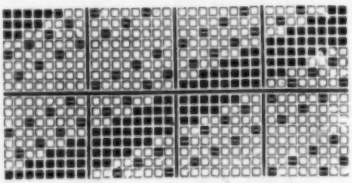


Fig. 175.

FLAT TWILLS.

These are steep twills reversed, the warp draft being used for filling, and the filling for warp, Figs. 154 to 159. Flat twills may have two, three or four times as many warp as filling threads in the pattern, depending on the angle of the twill; or the warp and filling patterns may each cover the same number of threads, which in such cases is an odd number, Figs. 155, 158 and 159.

STITCHED TWILLS.

Twills with a very long float in warp or filling make the fabric soft and spongy. To correct this defect, the floats are stitched down, in such a way, however, that the general character of the twill is not changed, Figs.

160 to 175. In these drafts, the stitchers where the warp is raised are indicated by the divided squares. These stitchers are either scattered over the warp or filling twill so as to make no continuous line, Figs. 161 to 166, 169 to 175; or they are arranged in faint twill lines, Figs. 160, 167 and 168.

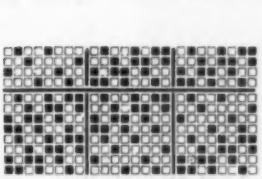


Fig. 176.

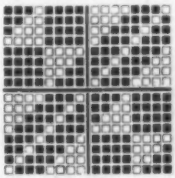


Fig. 177.

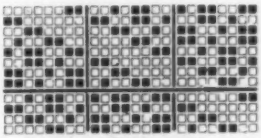


Fig. 178.

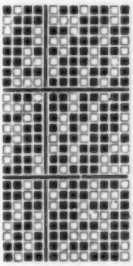


Fig. 179.

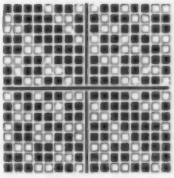


Fig. 180.

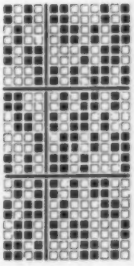


Fig. 181.

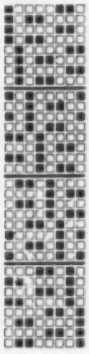


Fig. 182.

Figs. 161a and 163a show the goods corresponding to Figs. 161 and 163 respectively. The inclination of the twill at Fig. 163a is modified by setting the filling closer than the warp.

The set of the fabric is affected by the degree of stitching. The tighter the twill is stitched, the more open must be the set.

FIG. 161a.

FIG. 163a.

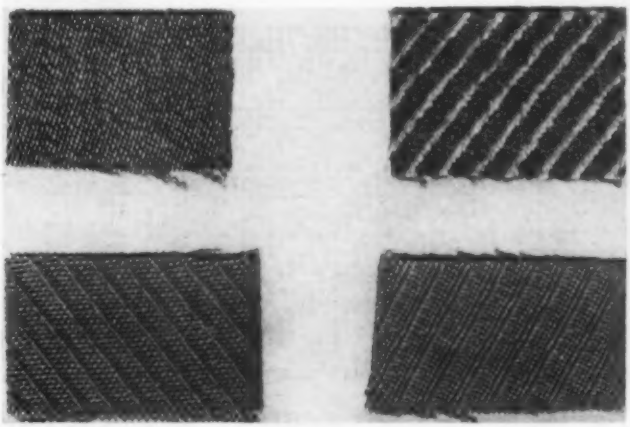


FIG. 185a.

FIG. 188a.

FANCY TWILLS.

Both regular and stitched twills give the goods a uniform appearance. twill is first formed over the given number of threads in the pattern. The subordinate weave effects are

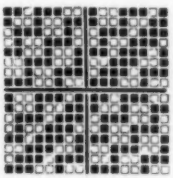


Fig. 183.

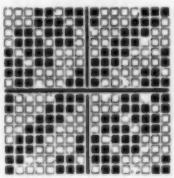


Fig. 184

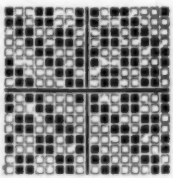


Fig. 185.

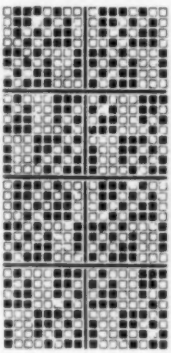


Fig. 186.

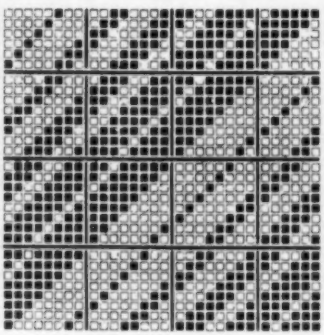


Fig. 187.

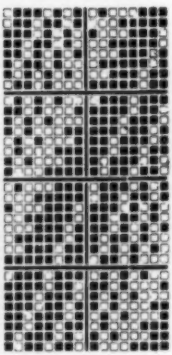


Fig. 188.

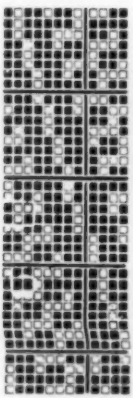


Fig. 189.

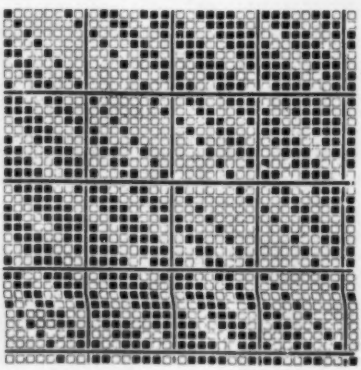


Fig. 190.

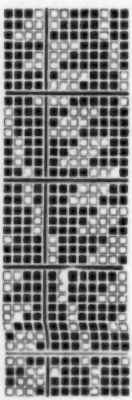


Fig. 191.

To diversify the appearance, weave effects are introduced which are, however, made subordinate so as not to destroy the principal twill effect.

In drafting fancy twills, the main then worked in so as to join neatly with the twill, very long floats being avoided. Figs. 176 to 191 are examples of fancy twills.

Shaded twills, which are also

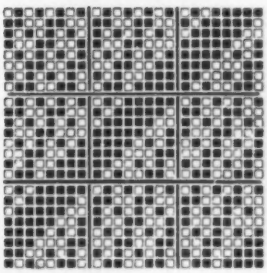


Fig. 192.

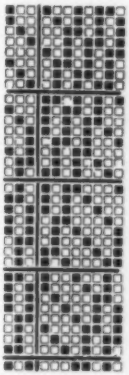


Fig. 193.

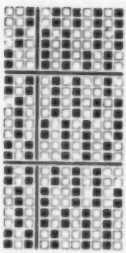


Fig. 199.

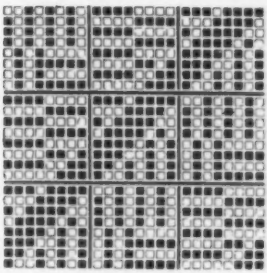


Fig. 200.

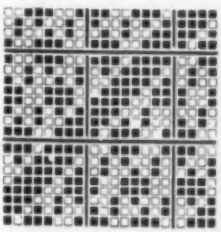


Fig. 194.

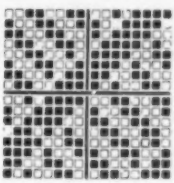


Fig. 195.

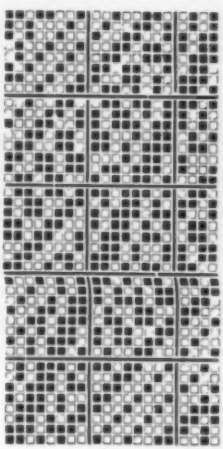


Fig. 196.

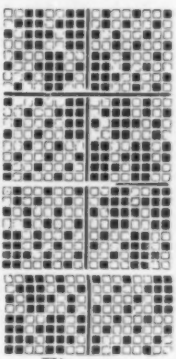


Fig. 197.

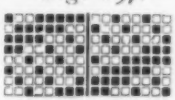


Fig. 198.

classed as fancy twills, are shown at Figs. 187, 188 and 190.

Figs. 185a and 188a are goods corresponding to Figs. 185 and 188.

COMBINED TWILLS.

Other fancy twills are shown at Figs. 192 to 198. These are formed by combining with the principal twill another one, which either runs parallel with the main twill or intersects it at a more or less acute angle.

The two twills must be joined so as to avoid causing a long float that would destroy the effect of either.

RIB TWILLS.

With fancy twills are classed the so-called rib twills, which are made by combining a twill with either warp or filling ribs.

The same care must be taken in joining the different weaves, Figs. 199 to 204, as is necessary in drafting the combined twills already described. The twill effect is made very distinct by having the color of the warp in strong contrast with that of the filling.

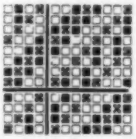


Fig. 205.

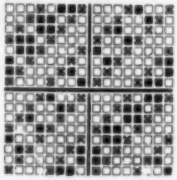


Fig. 206.

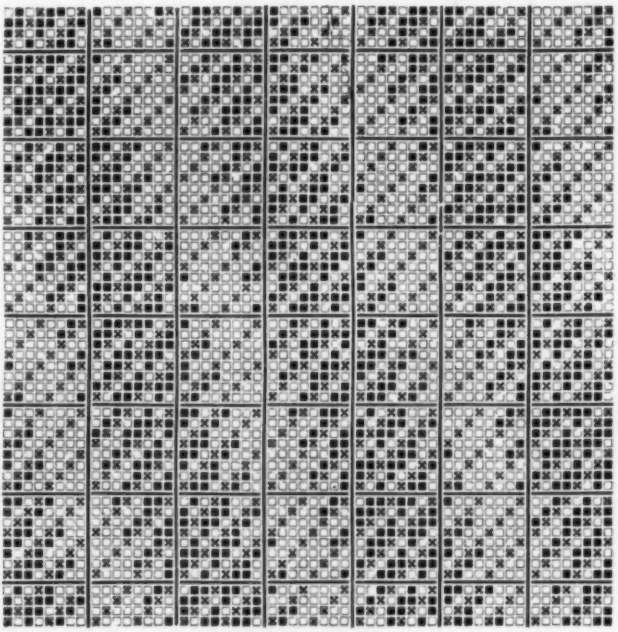


Fig. 207.

FANCY TWILLS FROM PLAIN FILLING TWILLS.

Plain filling twills are used as a ground work in the production of many beautiful twill effects of peculiar appearance.

A number of the plain twill patterns are used for the weave, and risers are then inserted to produce the effect desired.

Figs. 205 to 214 show several examples of these weaves, the foundation filling twill being indicated by crosses (x).

Fig. 212 gives a shaded effect; Fig. 214, the effect of scales on a fish.

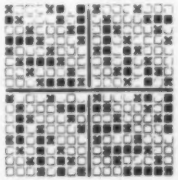
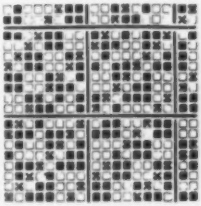


Fig. 208.



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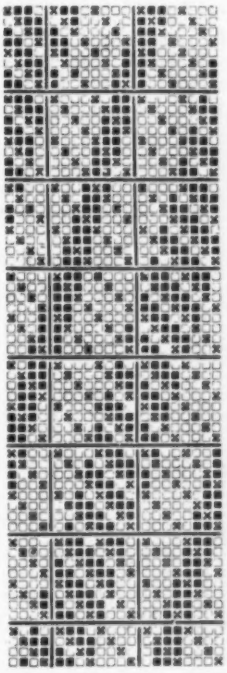


Fig. 210.

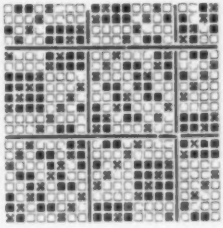


Fig. 211.

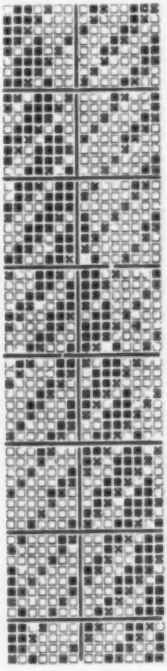


Fig. 212.

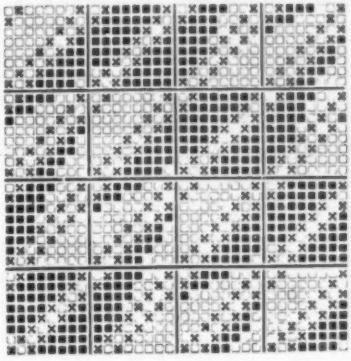


Fig. 213.

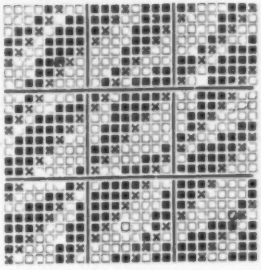


Fig. 214.

—War to some people is poetry in action.—J. Claretie.

—Timidity is composed of the desire to please and the fear of failure. —J. Sandreau.

Power Required for Woolen Machinery.

BY WILLIAM O. WEBBER, CONSULTING ENGINEER, BOSTON, MASS.

Apparently there is a somewhat similar misconception regarding the power required to drive woolen machinery at the present time, to that which prevailed some years ago regarding the power required to drive cotton spinning spindles, both mule and ring.

For a great many years it was or seemed to be universally misunderstood cotton spindles spinning a certain number of cotton yarn took a certain amount of horse power, no matter what the speed of the spindle was, and as far as mule spinning was concerned, not only not taking into consideration the difference in the speed of the spindles, but also neglecting entirely the length of time required in the draw, backing and twisting.

In woolen machinery the old allowance was that "a set," which was nearly universally considered to consist of three cards, four hundred spindles, six looms, one shear, one dresser, and one set of fulling stocks, could be driven by 10 h. p., and in some cases with as small a quantity as 8 h. p.; in fact, James Emerson, in his edition of 1878, on the testing of water wheels and machinery, page 180, gives the following variable figures:

The Inman Mills, Pascoag, R. I., heavy doe skin pant goods, 4 sets, used 40 h. p., equal 10 h. p. per set.

B. B. Webber & Co., Holyoke, Mass., pant goods, 8 sets, 64 h. p., or 8 h. p. per set.

Wm. Walker & Co., Lowell, Mass., flannels, 4 sets, 30 h. p., or 7 1/2 h. p. per set.

Vassalboro Woolen Mills, Vassalboro, Me., light cassimeres, 22 sets, 135 h. p., 6.14 h. p. per set.

In the tests made by my father in 1876, the lowest figure which he gives for a 48-inch card, carding 225 lbs. per day, is .77 h. p., and the lowest figure which the writer ever obtained on a 72-inch finisher card, carding 400 lbs. per day, is .71 h. p. At the same period, the lowest figure which my father gives for 400 woolen mule spindles is 1.9 h. p., and the lowest figure on a 90-inch broad loom on blankets at 68 picks per minute, .185 h. p. At this same period a shear required from 1 to 1.2 h. p., and a broad gig, about .9 h. p.; a set of fulling stocks working on one side only, from 2 1/4 to 2 1/2 h. p., making a set of machinery itself from 9 1/2 to 9.8 h. p.

In later years we find 60-inch breaker and finishing cards doing 300 lbs. per day, taking 1.23 h. p. each; 400 spindles requiring 2 1/2 h. p.; 90-inch blanket looms, .383 h. p.; shears about the same as before; gigs, 1 1/4 h. p.; and stocks, 3 h. p.; making 14 h. p. for a set of woolen machinery.

Tests made by the writer about a year ago show 72-inch cards doing 435 lbs. per day, 1.6 h. p.; 84-inch cards doing 500 lbs. per day, 2.15 h. p. each; 400 spindles, 5 h. p.; 90-inch broad looms, .63 h. p.; shears about 1 1/2 h. p.; gigs, 1 1/2 h. p.; fulling stocks, rotary, 3.08 h. p., and fulling stocks working both sides fully loaded, 5 h. p., making the total power for a set of machinery from 18 to 23 h. p.

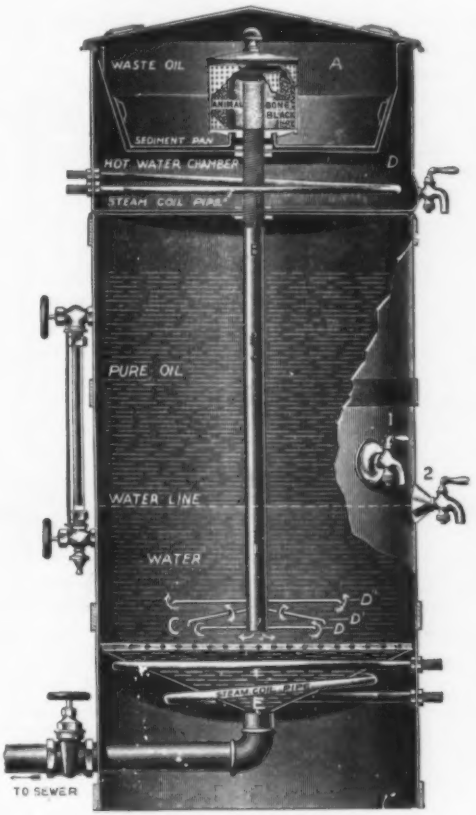
To these figures, for the ordinary equipment of a woolen mill, there are now added in many cases a dyehouse, requiring from 8 to 10 h. p., of which the hydro-extractors take all the way from 2 to 4 h. p. Oftentimes a garnet machine, requiring nearly a h. p., and a Gessner press, taking from .37 to .50 h. p.

Thus an 8 set mill today, instead of requiring 64 h. p., is often using from 115 to 125 h. p., and with a dyehouse and other machinery, close on to 140 h. p., and as now many of the mills operate their own electric plant, a mill of this size would require 30 h. p. additional to accomplish this result.

All of these matters, therefore, must be taken into consideration in estimating the size of the woolen mill which can be placed on a stream of a

given capacity, and compete successfully in quantity of output, as well as style of goods and finish, or if to be operated by steam power, in estimating the size of engines and boilers to be provided for a mill of a given capacity.

cating oil, and filtering it over and over, until it has been entirely used up. The saving in this way is said to reach from 50 to 90 per cent., depending upon how carefully the oil is collected after having been used. This is an economy which is not generally



THE AMERICAN OIL FILTER

The American Oil Filter.

A new oil filter which has just been placed upon the market by the Burt Manufacturing Company of Akron, O., is shown in the accompanying illustration, and a brief description of the principles involved in its operation should be of interest to all readers who are familiar with the great possibilities for economy which are afforded by the collection of waste lubri-

overlooked in large plants, but the American Oil Filter is made in small sizes which are a profitable investment in connection with engines where even as little as two barrels of oil are used in a year.

This new filter has been especially devised by the Burt Company for the filtering of very heavy grades of oil, which cannot be successfully cleaned in an ordinary filter because of the liability to clog up easily. The claim is

made that such oils are readily purified by this filter, give perfect results in the filtering of common engine oil. The fact that the oil is heated and thereby thinned immediately upon being poured into the filter, accounts for its high speed of operation and superior capacity.

By referring to the illustration it will be seen that the pan for receiving the waste oil is surrounded by a hot water chamber, through which passes a steam coil pipe. When this chamber and the lower part of the filter has been filled with warm water until it flows from faucet, 2, the filter is ready for operation, the proper steam connections, of course, having been previously made. The cleansing of the oil is then accomplished as follows:

Through the filtering material in the cylinder the oil makes its way into tube, B, and down onto the filter plate, B, where the pressure of the oil above overcomes the resistance offered by the weight of the water, and the oil spreads out in a very thin film, becoming thinner and thinner as it travels from the centre to the circumference of the plate. Every particle of the oil is thus exposed to the action of the water. This process is repeated as the oil flows upon plates, D 1 and D 2. The separation of every foreign ingredient from the oil is thus made complete. The remaining impurities then settle by force of gravity to the bottom of chamber, E, and are drained off by simply opening the valve. The pure oil is drawn from faucet, 1.

Attention is called to the minimum of attention required by this filter. Any kind of filtering material may be used, or none at all, and the filtering material may be removed without interrupting the oil service. The method of cleaning the filter is very simple, requiring only that the cylinder at the top be unscrewed, the filtering substance removed and the sediment pan lifted out and the large quantity of dirt and grit which has collected in it through force of gravity, removed. In nearly all other oil filters the bulk of the dirt is collected at the bottom—in the American Oil Filter it is collected at the top, greatly increasing the ease with which the latter may be cleaned.

The business of The Burt Manufacturing Company has grown to large proportions, over 12,000 of their oil filters having been sold during the past twelve years throughout the world. They are used in twenty-eight different countries, and have been adopted by ten governments. These facts, in themselves, would seem to be an ample guarantee of satisfaction, but rather than allow any opportunity for dissatisfaction upon the part of the buyer, the Burt Company are ready to allow a thirty days' trial of the filter to prove their claim that it will reduce lubricating oil bills at least 50 per cent. and satisfy in every way. Otherwise, it may be returned at their expense. Descriptive booklet can be obtained by writing to the Burt Manufacturing Company, Akron, Ohio.

A Continuous Wet Finishing Machine.

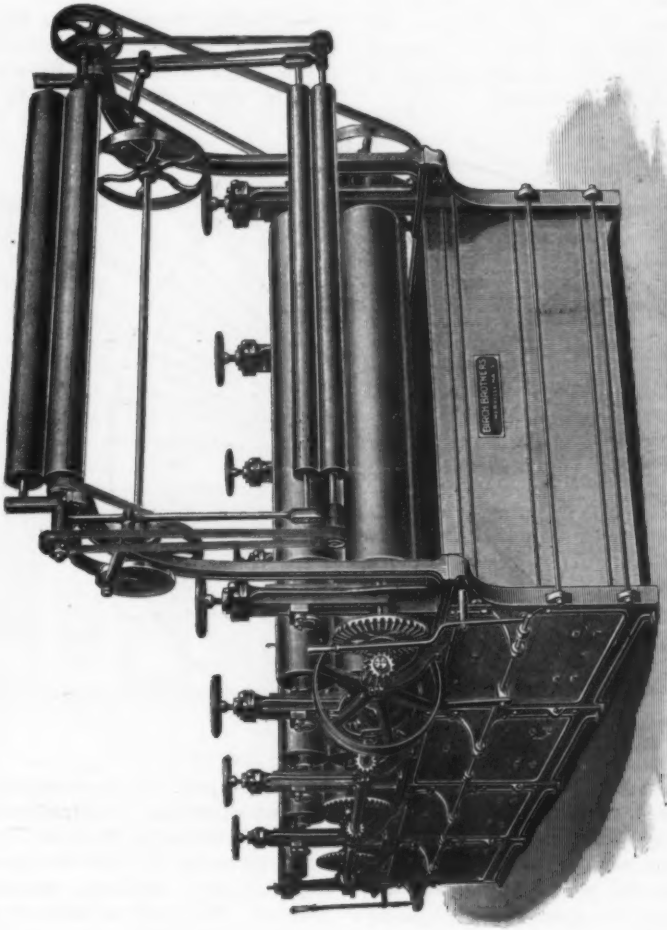
The accompanying illustration shows a machine built by Birch Bros., Somerville, Mass., and designed to do the work of the old style crabbing machine. The tank is filled with water, which is kept at the boiling point. As the water is not renewed except to keep it at the required level during the day, very little steam is required.

The goods pass alternately between squeeze rolls and through the hot water. The stretch rolls deliver the cloth at the boiling temperature and in a very pliable condition to the squeeze rolls, and the pressure of the rolls on the goods in this condition serves to remove washer, fulling and dye wrinkles and improve the general appearance of the cloth.

The goods leave the machine after passing between squeeze rolls that remove the surplus water, and are neatly folded for the next operation of finishing. The builders claim that in

many cases the last pair of rolls leave the cloth in condition for immediate drying without further extraction of the water in a centrifugal machine, thus avoiding the crumpling of the pieces as well as the expense incident to the last-named operation. They state that with this machine water marks are unknown, and shading from side to centre prevented.

The action of the machine is uniform from one side to the other, and the boiling water does much to remove the residue of soap and foreign material in the goods, which facilitates the drying operation. Two boys can operate the machine, one to feed the goods and the other to watch the operation. The builders state the capacity to be 7,000 yards per day. This is equivalent to a daily production of 3,500 yards if the same machine is used both before and after coloring.



A CONTINUOUS WET FINISHING MACHINE

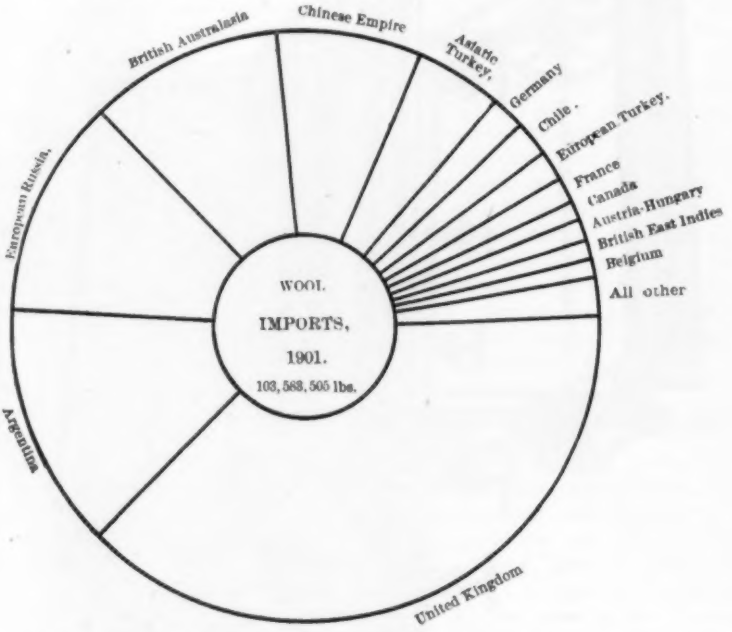
Imports of Wool.

For the year ending with last June the wool imported into this country amounted to more than 166,000,000 lbs., valued at $17,711,788, or 10 6/10 cents per lb. This was 63,000,000 lbs. more than for the previous year and shows both the increased demand and the failure of our own growers to supply the home market.

9	European Turkey,.....	1,711,595	1.65
10	France,.....	1,405,817	1.36
11	Canada,.....	1,192,059	1.15
12	Austria Hungary,.....	1,151,228	1.11
13	British East Indies,...	991,631	.96
14	Belgium,.....	950,841	.92
15	All others,.....	2,368,748	2.28
		103 583,505	100.00

One curious feature of this exhibit is that over three-eighths of this wool should come from Great Britain, a country which raises practically no wool for export. It shows clearly to what an extent the wool trade of the world has centred in England.

The condition is like that in the English cotton industry, essentially artificial. We find a country raising no cotton, but importing vast quantities to be re-exported both in the original condition and as manufactured goods. On the other hand, the same country raising no wool for export, imports an immense quantity, the bulk of which is re-exported in the raw state or in the form of manufactured goods.



No detailed statistics for the year just ended, showing the share of each exporting country in this trade, have yet been issued, but we give these statistics for the preceding year and also show the share of each country by the accompanying diagram and table.

WOOL IMPORTS FOR 1901.

		Pounds.	Per Cent.
1	United Kingdom,.....	39,298,126	37.94
2	Argentina,.....	13,948,341	13.47
3	European Russia,.....	12,431,155	12.0
4	British Australasia,...	11,146,390	10.76
5	Chinese Empire,.....	8,100 487	7.82
6	Asiatic Turkey,.....	4,93 ,340	4 76
7	Germany,.....	2,036,381	1.97
8	Chile,.....	1,919,366	1.85

An Accident Cabinet.

The frequent accidents, both serious and slight, among mill operatives generally find the bystanders at a total loss to render the necessary assistance. There is a hurried call for a doctor, and a loss of valuable time during which the application of some well known remedy would relieve suffering and in some cases save the life of the patient.

lb., 1 package iodoform gauze, 1 roll adhesive plaster, 1 bottle headache tablets, 1 pair scissors, 1 spoon, 1 package safety pins, 2 medicine glasses, 1 bottle carron oil, 1 bottle arnica, 1 bottle witch hazel, 1 bottle essence peppermint, 1 bottle aromatic spirits ammonia, 1 bottle sun cholera mixture tablets, 1 bottle soda mint tablets, 1 bottle rhinitis tablets.

A cabinet of this kind should be

Not only must those present know what to do, they must have the things to do with, and it is this last named necessity that the Standard Accident Cabinet supplies. It is manufactured and sold in two styles at a very low price by Putnam & Co., 150 Nassau St., New York. We illustrate Style No. 2, which contains the following assortment of supplies: 6 rolls linton bandages, 2 in., 6 rolls linton bandages, 2 1/2 in., 3 rolls cotton bandages, 1 1/2 in., 3 rolls cotton bandages, 2 in., 3 rolls cotton bandages, 2 1/2 in., 3 rolls cotton bandages, 3 in., 2 packages first aid for wounds, 2 packages linton gauze, 2 packages absorbent lint, 2 packages absorbent cotton, 1/8 located wherever any considerable number of people are employed.

—Popularity is like the air, a power that is better for raising than transporting.—Lamennais.

—When a Frenchman speaks ill of himself, do not believe him; he is just boasting.—E. Pailleron.

—Pointing to precedents does not clear you; it merely shows the spots on others.—P. L. Courier.

—When it is a question of receiving bombs, one should not put anyone else in his place.—Cte d'Haussonville.

Finishing Wool and Mixed Fabrics.

XVIII.

BY N. REISER.

Translated from the German for the Textile World.

Continued from September.

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MULTIPLE CYLINDER SHEARS.

To increase production, shears have been built with two or more cylinders to each machine, and although the object desired is attained, they have not

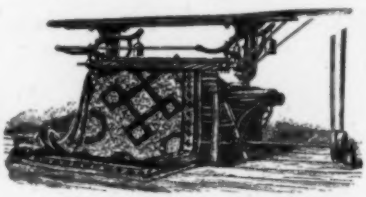


FIG. 62.

come into general use. In many mills where they have been installed, they are found running with but one blade in use.

out being cut, these multiple cylinder shears have proved best suited for such fabrics.

On a German shear having two or more cylinders, the spirals on the cylinder run in opposite directions; thus, the first cylinder will have the spiral running to the right, and the second to the left. It is claimed that by this arrangement the nap is raised and sheared better.

Fig. 63 shows an American two cylinder shear; the construction can be understood from the illustration without further explanation.

A shear has been built in England with three revolvers, one being used for shearing the back of the goods, while the other two shear the face. This machine has not met with any success, probably because the backs of the goods are so seldom sheared.

It is frequently necessary to raise and lower the revolver during the shearing of cloth to allow the seam to pass and for other reasons. In doing this by hand, there is danger that the operator will let the cylinder drop too hard, and thus disarrange the sup-

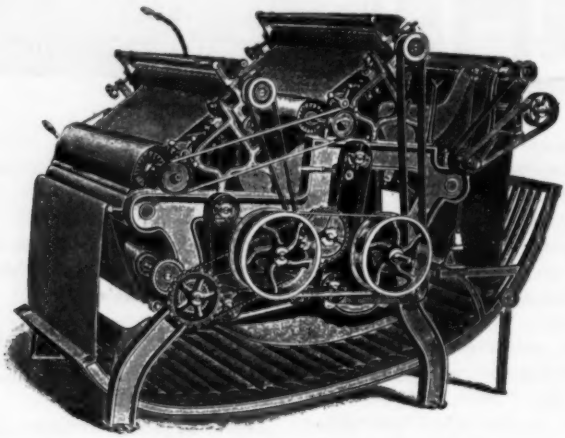


FIG. 63.

An objection to their use is the difficulty of watching the selvage on more than one rest; as the selvage of light worsteds is usually about the same weight and thickness as the cloth itself and passes under the blade without being cut, these multiple cylinder shears have proved best suited for such fabrics.

ports or, what is worse, spring the blade. Various devices have been proposed for doing this work automatically.

THE CUTTING PARTS OF A SHEAR.

These consist of the shear blade and

the cylinder resting against it. The cylinder or revolver has blades running lengthways in a spiral direction. Both shear and cylinder blades should be made of the very best steel, but not be too hard, otherwise the shear blade and revolver blades are apt to be nicked by the hard knots on the face of the goods.

It is very important that both the cylinder and shear blade should be tempered uniformly throughout the entire length. If there are hard and soft places in the blade, the edge will be made uneven by sharpening and, as a consequence, the nap will be sheared closer in some places than others. This difficulty is more serious with close sheared goods than with face finished cloths. The only remedy is to discard the defective part.

Although repairs to a cloth shear are expensive, it is still more expensive to postpone them, as defects cause such serious damage to the goods.

Next in importance to the cylinder and shear blade, comes the shear rest. They must be perfectly true, otherwise, the distance between the nap and shear blade will vary, and the former will be of irregular length. The high places in the rest will cause the nap to be sheared closer; at the low places it will be left longer. The rest must be straight in front as well as at the top, otherwise, the same defect will appear.

For shearing goods with a long nap a rest slightly beveled on the back is best, since it causes the nap to lay farther over the rest when passing the blade. For close finished goods a rest with a sharp edge at the back gives better results. This edge causes the nap to stand erect at the cutting point, and blade reaches closer to the bottom of the fabric.

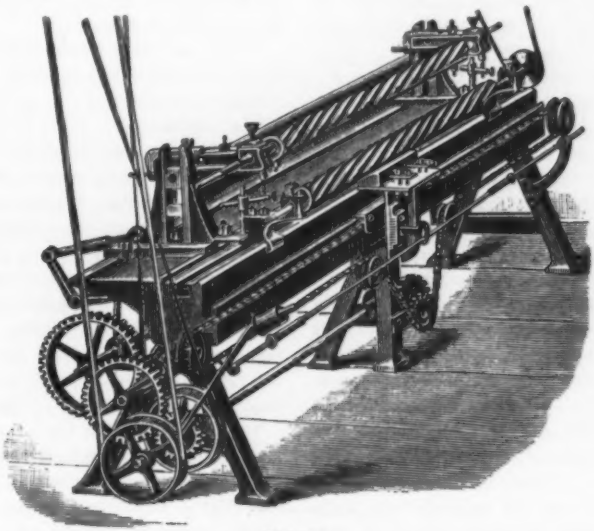


FIG 64.

GRINDING SHEARS.

For this work long experience and a natural aptitude on the part of the operator is essential. Written directions are of but little value unless supplemented by experience. The work is of great importance and requires great care; only with a sharp, perfectly adjusted shear can cloth be well finished.

The tools required for grinding are a steel straight edge the length of the shear blade, several emery blocks of

different sizes, a mixture of powdered emery and rape seed oil, a mixture made of red ochre and oil, an oil cup and brush.

The revolver is raised in its bearings so as not to touch the shear blade, and the straight edge is placed on top of it in line with its axis. Any unevenness can be detected by looking between the straight edge and revolver towards the light. The location of any high places is indicated by chalk marks placed on the cross girder back of the revolver.

Another method of testing the revolver is to rub the mixture of oil and red ochre over the straight edge and place the edge so covered on the revolver as before; the latter is then slowly turned by hand. If the revolver is uneven, the red ochre will appear on the high places and the low places will remain uncolored.

The belt driving the cylinder is now changed, so as to run the cylinder in the direction opposite to that in which it moves when the machine is in operation. The cylinder is then revolved by power, and the workman presses the short emery blocks lightly on the high parts. When all the high places have been ground in this way, the straight edge is again put on to the revolver, and if only very light variations remain, the grinding is resumed with a long emery block.

The bearings of the cylinder are now examined and carefully adjusted so that the cylinder will run steadily.

Next comes the testing of the shear blade. The straight edge covered with red ochre is placed on the edge of the blade, and if any high places are discovered they are ground down by hand with the emery block. After both faces are treated in this way, the blade is placed in position and the revolver lowered against it.

A piece of metal from ¼ to ⅜ inch in thickness is then placed under the screws by which the blade is supported, so that the blade may be ground as hollow as possible. The screws are then tightened, and the collars on the revolver shaft are moved to allow the revolver to vibrate lengthways.

The revolver and blade are then oiled and started up. Before this operation, the other parts of the machine should be well covered to prevent their being soiled by oil. From time to time the emery and oil is applied carefully with a brush to the cylinder, which is stopped to allow the mixture to trickle down between the revolver blades.

As the grinding progresses the cylinder is gradually lowered on the blade. The method of grinding depends somewhat on whether the goods to be sheared have a face or close finish. For finished goods, the front of the knife can remain somewhat thicker than for goods that are to be sheared close.

As the grinding approaches completion still greater care must be used in lowering the cylinder, and towards the last a mixture of oil and the finest emery is used in order to give the face of the blade a high polish.

To decide whether the shear is well ground, tests are made by cutting wet tissue between revolver and blade. If any places are found where the edge of the paper is stringy, the polishing should be continued until the defect is removed.

After the grinding is finished, the emery is wiped off and the front edge of the blade carefully touched up with a fine oil stone to remove any feather edge that might be left. Clear oil is then applied and the cylinder run for a time to polish the cutting edges. The entire machine is now well cleaned and the rests adjusted in position so that the blade comes in the centre.

The cylinder and blade are now tested with fine blotting paper. If this is not cut evenly, the cylinder should be slightly lowered. Frequently a shear during its operation requires light grinding. In such cases no disturbance of the revolver or blade need take place.

Fig. 64 is a view of a machine for grinding shear revolvers. The revolver is placed in the position shown, and an emery block automatically vibrated along the shear cylinder.

SHEARING.

The cutting parts of the machine should be carefully tested before the machine is started. The cylinder and blade are tested by wet tissue paper, and if the edge of the paper is stringy or fibrous, the revolver is raised from the blade, and the latter touched up with an oil stone.

If the cutting edges of the spiral blades are dull, the revolver should be turned end for end. If the tests with wet tissue paper still indicate a defective cutting edge, the cylinder should be brought forward a very little. If this does not remedy the difficulty, it is probable that there are irregularities in the blade of the revolver and that the cutting edge is worn down, so that the right contact between the blade and cylinder can not be obtained. In such cases, the shears must be ground as already described.

Assuming that the shear is in good order, the height of the blade above the rests must be adjusted. This depends upon the quality and kind of the cloth, and is regulated by two thumb screws, one on each side of the shear, which support the arms in which the revolver rests. These screws are held in position by a spring latch, the point of which rests in notches cut in the edge of the screw handle.

The adjustment of the blade to the cloth is tested by placing a narrow strip of cloth over the rest, then letting the blade down and drawing the paper from between the cloth and the blade. By making this test in several places and noting the firmness with which the paper is held, an experienced operator can adjust the blade very closely.

In making this test, both arms supporting the revolver should rest on the screws. When shearing chinchillas, boucles, montagnocs and similar goods, the blade must be raised high enough so that one can look between the cloth and the blade, as only the ends of the fibres are to be sheared. For such goods, the blade cannot be adjusted by testing with paper.

The shearing is begun with the blade well raised above the cloth. Several runs are made without changing the adjustment; if the nap is still too long the blade is gradually lowered, a notch at a time. A much smoother face is obtained by letting the blade down gradually, and the goods should receive several runs on the last notch to equalize the nap.

(To be continued.)

The Lovell Apparatus for Window Sashes and Shutters.

The G. Drouve Co., of Bridgeport, Conn., have placed on the market a new device for operating sashes and shutters called the Lovell, which is illustrated at Figs. 1, 2, 3 and 4. With this apparatus a line of sash 500 feet long can be operated from one station, if desired. It makes no difference what kind of sash is to be operated, the apparatus working equally well with sash hung from the top, pivoted at the sides or at top and bottom, or hinged at the bottom. It can also be applied to sliding or ordinary lifting windows. As the operating station for an entire building is, unless otherwise ordered, always placed on the wall at end or side of building, in case of fire the windows can be quickly closed, while the people are leaving the building. This is a feature which will appeal at once to the owners of large factories and mills.

Fig. 1 represents a perspective view of the device operating a line of windows, which are partially opened.

Fig. 2 is a front elevation of one of the windows closed, and a broken view of the operating rods adapted to move in the direction shown by the arrows.

Fig. 3 shows a broken view of the link-arm 1, whose forward end is pivoted to the U-shaped clip, 2, which is swiveled to the sash plate, 3; the other end of the link-arm is swiveled on the headed pin, 4, which connects the arm

FIG. 1.

link to the U-shaped clip, 5; 6 is another U-shaped clip, swiveled on the collar, 7, by the headed pin, 8. These two clips are also connected by the pin 9; 10 is a set screw for securing the collar to the operating rods, 12 and 13, shown on Fig. 2.

Fig. 4 represents one of the adjustable hangers, 11, for supporting the operating rods, 12 and 13, shown on Fig. 2. This bracket is adjustably connected to its base, 14, by the bolts, 15. This base is adapted to be secured to any convenient place either by means of the holes, 16, in the foot, or the holes, 17, in the face. The operating rods, 12 and 13, shown on Fig. 2, pass through the openings, 18, and are supported in the brackets by means of the anti-friction rollers, 19.

The G. Drouve Co. has already taken contracts for the installation of

the apparatus in some large buildings, both East and West, and they will undoubtedly have their hands full

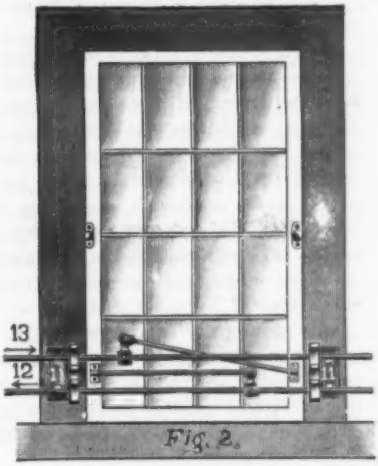


Fig. 2.

in supplying the demand as the device becomes known, for owners of factories and mills have long been looking for a system which would give

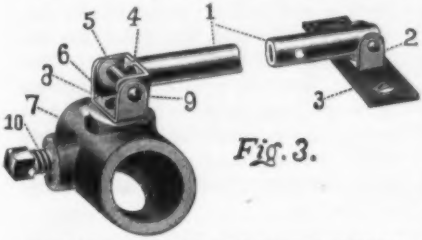


Fig. 3.

perfect ventilation and permit of being operated quickly and easily. Fig. 1 shows a section of 320 feet of sash,

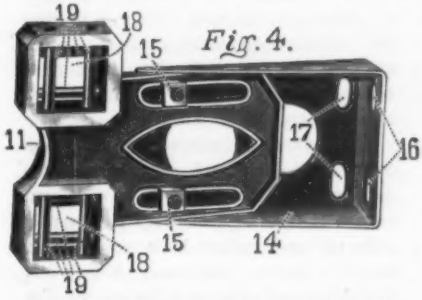


Fig. 4.

operated from one station, just erected in a Bridgeport factory. The apparatus is strong, durable and practical, and the G. Drouve Co. justly feel that they have at last succeeded in producing a perfect opening device, and they will cheerfully submit estimates for erecting the apparatus in any part of the country. Their skylight and sheet metal work is favorably known everywhere, and their factory at Bridgeport is a very busy place.

The Waste Silk Industry.

HENRI SILBERMANN.

II

(Continued from September.)

A very old method of disintegrating silk waste and cocoons consists in fermenting or rotting the material. The waste is first boiled for a short time in water or in a weak soda solution, then heaped up in piles and left for several days. The heat, moisture and organic matter in the cocoons induces a fermentation which either destroys or loosens the substances adhering to the fibre.

This process is accompanied by a very offensive odor, which sometimes clings to the finished product. Fermentation in the open air is, at the present time, but occasionally employed, the process being generally carried on in vats. The material is saturated with a 2-3 per cent. soap or soda solution, then placed in latticed crates which are 4 to 6 feet square and 6 to 8 feet deep, each holding about 440 lbs. of waste silk. These filled crates are then placed in a vat and covered with warm water which is heated to 176° F. The crates are held under the liquor by planks fastened above them. The material is left in this condition from 2½ to 9 days, at the end of which time the temperature is lowered to 114-122° F.

Insufficient fermentation results in a product lacking lustre and elasticity, and having a husky, straw-like handle. By over-fermentation the handle of the material is injured, its strength

impaired, and a dull, woolly appearance produced. For this reason, the utmost care is essential to the success of the process.

When the fermentation is completed, the liquor is run off and the material rinsed in a hot 1½ per cent. soap solution. The material still contains from 7-8 per cent. of its natural gum, which may be entirely removed

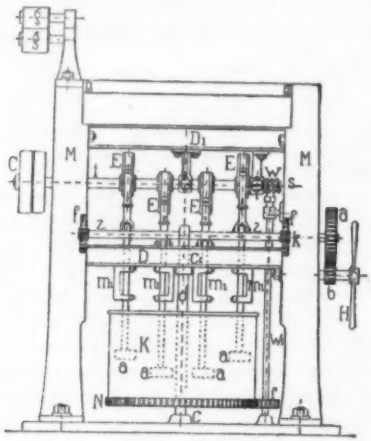


FIG 1.

by the boiling-off process. This, however, is not advisable, as a slight residue is an advantage in the carding and spinning process, preventing electricity and helping to save the staple.

Lately, iron tanks have been used, in which wooden racks are fastened to hold the loose material in position. Less time is required for the process with these tanks, as there is a smaller quantity of material under treatment in them. This method necessitates more care than the others, as it is usually carried on at a higher temperature.

To remove the odor, Beyer recommends that the yarn or cloth be boiled fifteen minutes in a solution of soft soap, then washed and steamed for several hours. The material is next piled up in thin layers, salt being sprinkled over each layer, after which it is steamed for several hours. It is then rinsed and bleached in the open air, or dried. This process is repeated each day for about twenty days; finally, the material is rinsed in running water.

Owing to the foul odors arising during the process, the operator is liable to come in conflict with the sanitary authorities. Nevertheless, it cannot be denied that however old, unclean and tedious the fermentation process may be, it gives a product possessing in full the natural softness and pliability of the silk, and working much better in the subsequent processes than when treated by other methods.

This superiority in the product has led to many experiments for disintegrating raw silk waste without the use of strong alkalies and also without fermentation. So far these efforts have been unsuccessful.

Guinon employed a soda solution under pressure of two atmospheres with a subsequent treatment in dilute sulphuric acid. Pelangie and Bedu used a solution of bromide and tartaric or citric acid, a process that not only attacked the gum, but the fibre itself. Randall treated the cocoons with a dilute solution of acetic acid containing a proportion of sulphuric acid. The material was left for some hours in this liquor at a temperature of 158° F.

Another method, which is said to be suitable for wild silk, consists in handling the material several hours in dilute sulphuric acid heated to 140° F., then cooling and, finally, boiling off. Dilute muriatic acid is recommended by Randall: The liquor is heated to 140° F., and forced through the material by a pump.

The following process has been recommended for wild silk: After the material has been washed in warm water, it is saturated with a saponifiable oil and boiled in a solution of metallic salts, stannous, aluminate, plumbate, silicate and borate of the alkalies or ammonia. The boiling

process converts the oil and salts into soap or free glycerine.

Attempts have been made to disintegrate raw silk waste by treating the material with gas and thus avoiding the injury incident to washing and tearing the silk as employed in other methods. The vapor of sulphuric acid, benzine petroleum, carburetted hydrogen, carbonic disulphide, etc., have been used in this way. After working on the fibre, the gas is condensed in a separate vessel.

tom and under which the dirty water is collected. The arrangement and operation of the stampers can be easily understood from the illustration.

The material is next treated in the cold washer, which is built on the same principle, but with a larger capacity. Fig. 4 shows the front and side views of a cold washer, in which is shown the rotary table, e, on which the material is spread in an even layer. In the front view are seen sixteen wooden beaters, four of them be-

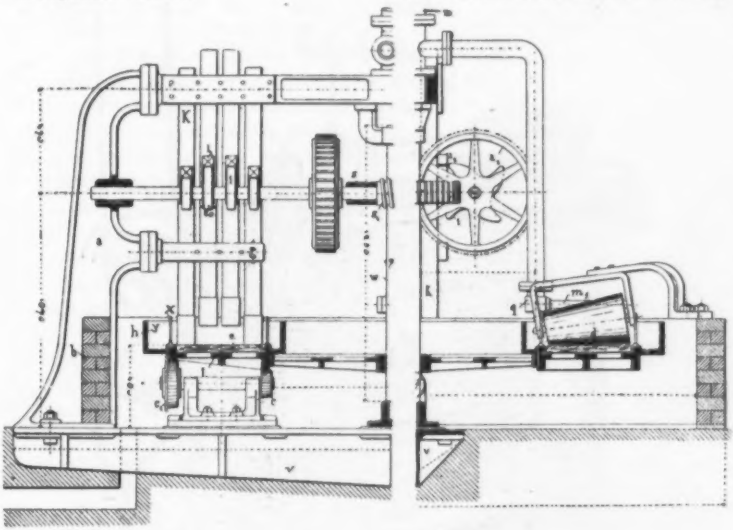


FIG. 2.

By whatever method the silk has been treated it is necessary to give the material a thorough washing, to free it from the foreign matter that has been loosened by the previous process. The most frequent method consists in taking the silk, while still hot from the previous operation, direct to the warm washer, where it is treated for a longer or shorter time, depending on the quantity of foreign substances in the waste, in a warm solution of soap, being pounded at the same time with wooden beaters. Cold water is apt to cause a precipitation on the fibre, destroying the lustre.

Fig. 3 shows a warm washer consisting of a kettle, K, with a false bottom raised 4 inches above the bot-

ing shown in the illustration, which are alternately raised and let fall on the material spread on the table.

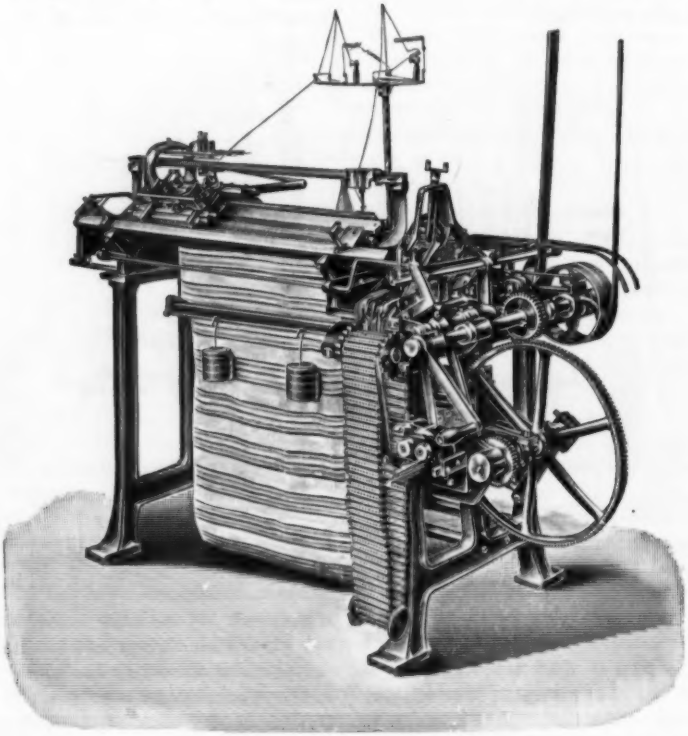
The rinsing water is supplied by the pipe, n, to the perforated distributing pipe, ml. Near this pipe are two squeeze rollers, d, for squeezing the waste. The waste water passes from the table through the rack, s, which prevents the passage of the waste. The water then runs through the perforated sides of the box, y. The quantity of material handled by this machine depends in great measure upon the pressure and supply of water. Sometimes the same machine is used for both warm and cold scouring. The waste is next extracted.

(To be continued.)

A German Knitting Machine for Sweaters and Fancy Goods.

The illustration shows an improved type of German knitting machine which has won much favor and is in extensive use on the continent and in England, and is now being introduced in this country.

The picture shows the power machine, which is fully automatic and the operator is required only to replace empty bobbins by full ones. An electric stop motion prevents breakdowns and bad work. This machine is built in from one to eight sections. One operator is able to tend four sections, or four single section machines. A specialty is made of machines for knitting sweaters, golf jackets, vests, etc., with plain, honeycombed and other fancy stitches. There is a good demand for this class of goods now.



Besides this machine, others are built for different classes of fancy knit goods.

E. H. Ludwig of Hawley, Pa., is the American agent for this line of machinery. He is a practical man of long experience in the knitting trade, and particularly in the class of goods for which these machines are especially adapted, and knowing their merits is convinced that there is a wide field for them in the United States.

Besides this special machine illustrated above, his line also includes automatic full fashioned machines for underwear, also for gloves and mittens.

—Tell me what you eat, and I will tell you what you are.—Brillat-Savarin.

The Trials of a Young Superintendent.

BY BEN SHAW.

III.

(Continued from August.)

Why she will persist in making more work for herself by doing so, I do not know, unless it is the general "cussedness" of humanity, or a combine between her and our competitors to produce weak roving. For tension is the all-important thing in a card room, and is the cause of more trouble than any one thing.

After a time I found that the number of hands on the pay-roll was slowly but surely decreasing, owing to the improvement in the running of the machinery. I was quite sure, however, that the number could be reduced still more with a little effort. I had an idea that a little well directed energy on the part of the overseers might work wonders, so I called in Walker for consultation.

"Dan, I want to cut down the names on the pay-roll, and I thought you would like to help the cause along."

"I've had an idea in my nut for some time that I've been thinking of springing on you," he replied, "but I don't know how it'll work, and probably I won't never know 'til I try it on. It strikes me that that knock-off dog on the breaker and intermediate pickers gives a man a darned good chance to crawl off somewheres, and if they warn't on there, they would have to be around to spring the laps before they got too big. Then the pickers would be running all the time instead of knocking off, and by keeping them jumping I guess I can save two or three men that way."

"I think you'd better try it," I said, "it is worth trying. And, Dan," as he was going out, "you know 'one good turn deserves another.' I notice that your card strippers go on the back of the line where they strip with the hand cards, and each one has a helper to go along the front and piece up. It seems to me that if we had the stripper handles turned around, they could strip from the front of the line and piece up their own ends. What do you think of that scheme?"

"Well," he replied, "they may be a little lonesome at first, but they'll probably get used to it after a while and won't mind it so much. I'll see how it fits them anyway."

After a few days, he came around to report progress.

"They didn't like it very well at first," he said, "but after they did a little grumbling they settled down to it."

"What made them settle down?" I inquired, for I suspected he had a hand in the settlement.

"Don't know," he replied, "except perhaps they heard that I said I'd give them a chance to swap jobs with the men that got through if they didn't like the new way. I guess that fetched them, mebbe."

I found that it had been customary to keep spare men to take the places of those who might happen to be out. These spare hands were supposed to be kept busy at odd jobs, but it usually took one man all the time to find work to keep the others busy, which was economy which I could not understand.

I eventually succeeded in dropping them entirely by having the regular hands do double duty, with an allowance of some extra time, say two or three hours for a full day of doubling. I found this a very satisfactory arrangement on all sides, with a profit to the mill and the operative.

Every day would bring to light some new change to be made. It was perhaps not always an important one, but the loose ends were gradually being picked up. A look at the web of cotton coming from the doffer of the card would occasionally reveal a dent in either the cylinder or doffer clothing, which had been overlooked by the grinder. A cloudy patch in the web

shows a dent in the cylinder, allowing more fibres to gather at that place than elsewhere. A hole in the web means a dent in the doffer clothing, failing to touch the cylinder as it revolves.

The trumpet on the railway head will bear considerable studying. If it is too large for the weight of sliver

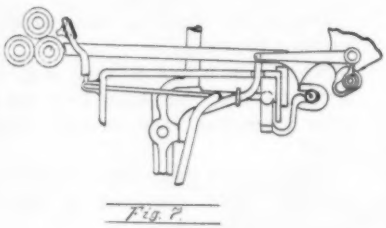


Fig. 7.

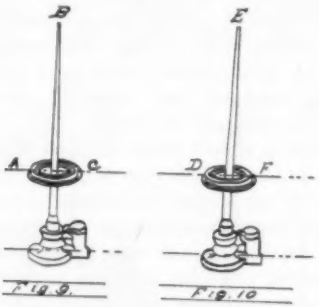


Fig. 9. Fig. 10

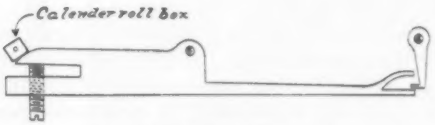


Fig. 8.

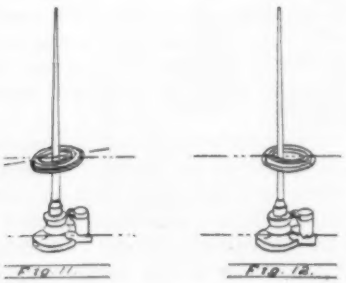


Fig. 11. Fig. 12.

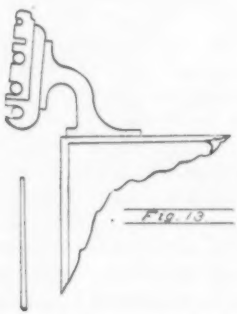


Fig. 13

running, there will not be friction enough to draw it forward when an extra large bunch comes along, or even to keep it forward at all. On the other hand, if the trumpet is too small, the sliver will draw it forward continually to the calender rolls.

Then the setting of the trumpet depends on the length of the staple. With short staple the trumpet shall be set as near the bite of the calender rolls as possible, as, on account of the necessary friction of the sliver passing through, some pull must be exerted by the rolls, and the chance of excessive drawing at this point and weakening the sliver is greatly reduced. If long staple is used, the trumpet should be set well back from the calender rolls as, in case of its becoming filled up with waste, or from any cause the sliver should pile up behind it, the long staple would simply hold the trumpet forward and the knock-off would not work. See Fig. 7.

If the knock-off lever is set too closely to the T striker any slight jar will cause the machine to knock off without reason, as will be seen in Fig. 8.

A small defect often causes much worry, and defies the most strenuous efforts to find the cause. The traverse rail on a fly frame one morning would rise a few inches and then slip back.

or, at least, fail to go any higher. I found Dan and Billy, his right-hand man, a sort of Robinson Crusoe's Friday, down underneath the frame in a systematic hunt for the trouble.

"Billy worked on this confounded thing all yesterday afternoon, and couldn't find out what ailed it," Dan explained, "so we've started at one end and we're going clear through it, if we live long enough."

"Well, we found it," he said, later in the day, "but we had to go clear to the other end before it showed up, and it was nothing but a measley nut on the traverse gearing that had worked loose and wouldn't let the gear teeth hold in the rack. Now, why in thunder didn't we start at the other end of the machine? Will you tell me that?"

I could only say that it was probably the general perversity of human nature, the same thing that coaxes a man to go into the sitting room in the dark, after his wife has moved the furniture around and forgotten to tell him about it. Instinct is a funny thing, and a great many times a man would be better off without it.

While all these changes had been going on in the carding, it must not be understood that no attention was being paid to the spinning room. Indeed, I had found it badly in need of attention, but here was an entirely different proposition.

The overseer in charge, Moses Bancroft by name, but usually addressed as "Mose," was at some previous age considered a practical spinner.

He had, however, a strong tendency towards inventions, and his fancies had been given a free field in which to work, to the detriment of the mill. I found, too, that he was never willing to admit that he was in the wrong, but would simply maintain a dignified silence, for he evidently valued his job more highly than he did the children of his inventive genius. This suited me, however, for I was of the opinion that it was much more creditable to improve the man in hand, if possible, than to replace him with a new one who may turn out worse than the first.

I was first struck, on going through the spinning room, with the number of ends breaking down. Wherever I stopped to look around they were breaking on all sides. Of course, in any spinning room you must expect some of that sort of thing, but you don't expect dozens of ends on one frame.

I turned to Bancroft, who was keeping close to my elbow and who had the air of a chief marshal in a torchlight parade, and said:

"What makes so many ends down today?"

"Ain't no more down than any day, far as I can see," was his encouraging reply.

"And don't you try to stop it?"

"What's the use? The stock they buy is rotten."

"Do you mean the cotton?" I inquired.

"Yes. It hain't got no 'take hold.'"

That was a new property of cotton to me, and I had spent a few summers in Texas, too. But the excuse sounded familiar. That is the easiest excuse to trump up for bad work, and the hardest to prove to the contrary.

As I didn't buy this cotton I said nothing, but made up my mind that when I did buy the next lot I would give him a chance to show me what he knew about cotton.

I stepped up to a frame and examined a thread guide. The thread had worn a sharp crease into it, and the twist simply could not run back to the bite of the rolls as it should. Without any twist between the front rolls and the guide, the yarn must break at the slightest shock. I found them all in about the same shape. Occasionally one would be all right, apparently where the old one had broken off and they had been obliged to put one in.

"Have you any new guides?" I asked. He replied that he had two or three, that was all.

"You'd better have the shop man get you some more, and get a size larger wire so they'll fit the hole better and won't work loose," I said. "And, by the way, before you put them on, be sure your spindles are plumb. Do you know they are all right?"

"I suppose they are. They look all right," he replied.

"Look! Don't you have your man go over them and see if they are all right?" I asked, getting a little warm.

"We never did. The man that made the frame put them up plumb, I suppose, and they ain't never been moved."

A good argument for a practical spinner!

"Well, you put a good section hand on these, one who is awake, and have him go over those spindles and level up the rings. And when he finds the rings worn, have him put in new ones. We might just as well begin now as any time."

I thought I had made quite a start towards getting rid of the weak yarn. If, as "Mose" had said, no attention had been paid to the adjustment of these twenty-five thousand spindles, it was pretty safe to reckon on a large percentage of damage right here.

By referring to the diagrams, it is easy to see what I was "up against."

Fig. 9 shows the spindle plumb and in the centre of the ring, while the ring is perfectly level with the frame. The distance from A to B and C to B are equal and the yarn would go around smoothly.

Fig. 10 shows the spindle out of plumb. The distance from D to E is greater than from F to E, so that whenever the yarn reaches the point D, a shock must result, and with the spindle making eight thousand revolutions, the effect of these continuous shocks must be weakening to the yarn.

Fig. 11 shows a ring out of level, while Fig. 12 shows the spindle not in the centre of the ring. In both cases the result is the same as in Fig. 10, the end very likely breaking down where the drag occurs.

Rings which are not wound will cause this same trouble, and in all of these cases will tend to wear out the traveler faster than it ordinarily would.

Crooked spindles can nearly always be detected by placing the finger on the top while in motion. A crooked spindle tends to throw the bobbin up from the socket or cup, causing it to lose several turns of the spindle, and consequently several turns of the twist, and making soft yarn. Sooner or later, the spinner or doffer will see this bobbin slipping up and will crowd it down into place, but makes no attempt to remove the bad yarn.

In the course of my investigations, I found that "Mose" had been given a free hand as far as his inventions were concerned.

Fig. 13 shows the manner in which he had fitted out several warp frames, and for which I had to ask an explanation.

"What does it all mean, Bancroft?"

"Well, you see, I wanted to get the yarn to run right down to the spindle without any turns and crooks, so I just had them roll stands made out to the shop. You see the front roll hangs almost plumb over the spindle and there ain't much turning corners for the thread."

"But you hav'n't any thread guides. What keeps the thread over the centre of the ring and the point of the spindle?"

"Don't need nothing. The thread just stays there."

"But it won't stay there when your traverse rod carries it away from there. How about that?"

"I took the traverse rod off," was his startling reply.

"And let the yarn wear a groove in the roll. How long have these things been on?" I asked, rather impatiently.

"Not very long," he replied, with a slight show of ruffled plumage.

I thought that if anybody was to feel ruffled I had that right.

"You'd better strip that stuff off and put back the old stands," I said. "Have you saved them or did they go into the scrap iron?"

He thought they were around somewhere, and he would find them if I must have them.

"It is you who wants them; not I," I said.

I saw that he was beginning to sulk, so I thought he might as well have enough to sulk on to make it an object.

"And right here, Mose, I may as well tell you that I'm not much of a stickler for new inventions. I know somebody has to do it, but inventions cost the mill trying them too much money, and I propose to give the other mills a chance to pay for it if they will. So I guess we'll do away with the inventing business. Just put your mind on that cut yarn. There are tons of it. I should think. That's a blamed sight better object."

And that was true, too. We were flooded with cut yarn. It was going to be a grind to get rid of it. Of that I was very sure. So many things will cut the yarn that only "patience and perseverance," as my old writing book used to say, would conquer them.

(To be continued.)

A Knitting Machine Needle.

Side views of a knitting machine needle, recently patented in this country, by Robt. W. Scott & Williams, will be found at Figs. 1 to 4, Fig. 5 being a back view, and Fig. 6 another form of the sample device. The inventor states that in operating knitting machinery employing latch-needles, the principal cause of breakage is the presence of knots or lumps in the yarn, which, being too large or thick to pass through the hook of the needle when the latch is closed upon it, result in the breaking or bending of some part of the needle, the consequence being that the yarn loads up on the broken or distorted needle and interferes with the neighboring needles on each side, thus spreading the trouble until, if the machine is not stopped, the whole set of needles is involved, and serious damage to the cams and other parts results.

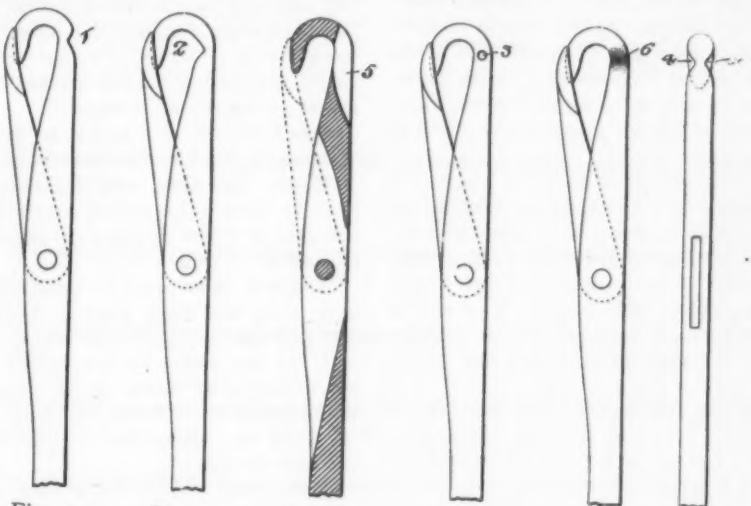


Fig. 1. Fig. 2. Fig. 6. Fig. 3. Fig. 4. Fig.

Sometimes the knot or lump laterally deflects the latch to such an extent that it fails to direct the stitch over the hook of the needle, thus permitting yarn after yarn to engage with and be caught and held by the hook. In other cases there is a par-

tial or complete straightening of the hook, or, again, a breaking of the point, the latch in each case being rendered inoperative, with the resulting objectionable loading up of the yarn on the needle.

It is claimed that this is overcome by locally weakening the upper portion of the needle so that, when undue strain is exerted upon the hook, the latter will be so broken that the yarn cannot be caught and held, the result being that the needle simply drops its stitch, the trouble being confined to the needle or needles originally broken. Hence instead of causing a large and unsightly hole in the knitted web incapable of being mended, a drop-stitch alone results, which can be readily mended and the web saved.

The method as shown in Fig. 1 consists simply in nicking or notching the back of the hook, as at 1, at the point where it joins the stem of the needle, while in the needle shown in Fig. 2 the same result is effected by a nick or notch, 2, in the throat of the hook at the same point, and in the needle shown in Fig. 3 an opening, 3, is there formed, while in the needle shown in Fig. 5 the shank is thinned by depressions or nicks, 4, in one or both sides, as desired.

In that form of needle shown in Fig. 6, the result is attained by forming a slot, 5, in the back of the hook, and in the needle shown in Fig. 4 the weakening of the hook is effected by hardening, as at 6, at the desired point of breakage.

In each of these cases undue strain upon the hook will cause the same to break at the point where it is locally weakened, and the upper end of the needle-stem will then present no portion capable of catching and retaining the yarn. Hence the loading up of work upon the needle and the damaging results due to such action are effectually overcome.

While it is preferable to locally weaken the hook of the needle, so that, in the event of breakage, the bent upper portion of the hook will be the only part carried away, the weakening may be at a point lower down on the stem of the needle so long as the part broken off is not such as to interfere with the proper continuance of the knitting operation by the other needles.

Notes on Steam Engineering.

BY EBEN GOULD.

During my time as master mechanic and engineer in the various places, I have had many different men come to work for me. Many of them were young men that had never worked in a mill nor in a machine shop.

First I will tell of a young lad that was raised down in the back woods of Maine. His name was Ned Choppit. He came to me asking for work, and said he would like to learn to run an engine. I said:—

"You will have much to learn and have many hard days' work to do before you will be a good engineer."

"I am not afraid of the work. I am willing to do that if in the meantime I can learn to be an engineer."

I liked the appearance of the lad and said to him:—

"Well, Ned, if you are willing to begin at the beginning and go clear through all that will be required of you to become an engineer you may go to work as soon as you like. When you are ready, come to the repair shop and I will give you a job."

At that time I had four different engines under my care, besides doing the repairs for all the machinery of the mills.

Several days later, Ned came to the shop ready to go to work. I then told him what my idea was of what a good steam engineer should be able to do. In the first place he should learn to be a good machinist, so that he would be able to do many of the repairs which would be needed to be done on his engine, for in time he would find that there was a good deal to do besides

starting, stopping and oiling his engine.

Then again, if he should get a place a long distance from where his machine was built and from any engine repair shop then the engineer would have to do most of his repairs himself.

Thus I explained to Ned why I should require him to commence in the machine shop to learn to master his engine, although whenever there was anything to do after shutting down at night, I would have him come in to hold the light and while doing so, he could see how many of the small jobs were done and the engine cared for. We had enough of such jobs on the four engines, so that in a few months Ned could do the packing of valves and other small jobs quite handily. He stuck to the work in the shop and became one of the best hands I had.

I had never said a word to him about any work in the fireroom, neither had he ever said anything to me about firing. After he had got well posted in regard to the machine shop, I said to him:—

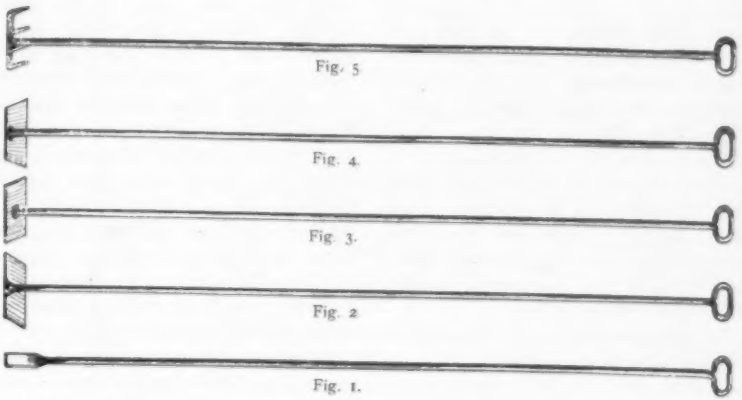
"Well, Ned, I guess it is time to put you a little nearer the engine. You have done well in the shop and now the next move will be nearer what you want."

So we started, but instead of stopping at the engine, we went to the fireroom. Ned looked a little surprised when I said to the old fireman:—

"Bill, I want you to learn Ned how to fire. You know my way of firing; learn him just as I have learned you. One of the men is going to leave, and Ned must take his place."

I saw Ned look and said to him:—

"Ned, a man can never make a good engineer unless he can control his fireroom. If you try to run an engine without being able to manage your fires, you will be all the time at the mercy of your firemen, but if you can come from the engine room into the fireroom and rush up steam independent of your firemen, you will be master of the whole business and I want to make you a first-class engineer."



That was enough. Ned went at his new work like a good one, and was soon one of the best of firemen.

Soon after this, one of my engine men got a situation elsewhere, and then I put Ned in his place. He found that there was but very little to learn, as he had learned it all in the machine shop and fireroom. A short time after when the state inspector of boilers called, Ned was given a first-class engineer's license.

Soon after, he was made engineer

of a power house for one of the electric roads, and is now master mechanic in one of the large woolen manufactories in this state.

Besides the coal shovels, all the tools for working the fire are a breaker, Fig. 1; a slicer, Fig. 2; a pusher, Fig. 3; a hoe, Fig. 4; and a rake, Fig. 5. These are made of 3/4-inch round iron about 9 feet long.

The breaker, Fig. 1, is a straight rod flattened at the end for the purpose of sliding under the fire on top of grate bars just to clear the ashes and allow the air to pass up more freely into the fire, but in no case to break up the fire.

The slicer, Fig. 2, is used for the same purpose. The blade is about 6 inches long welded to the rod and made sharp on the outer edge. This is used immediately after the breaker; if used in this way, it will not break the body of the fire.

The pusher, Fig. 3, is made by a piece of flat iron about 6 inches long by 2 inches wide with the rod riveted at the centre. This is used for leveling the fires on the top, so as to have the fire of an even thickness over the whole grate surface.

The iron fire hoe, Fig. 4, is used for drawing fires when necessary.

The fire rake, Fig. 5, is used to clear the fires of clinkers or cinders should any be found.

At the time I first commenced firing and for a number of years after, it was all hard coal that was used, but about the same tools were used in both cases. It was along about 1870 that soft coal came into general use in the mills where I worked. I soon found that soft coal was the best to use in a woolen mill or in any place where an uneven quantity of steam was required from one set of boilers. With hard coal, while drawing steam for the dyehouse and power for the mill, you would have to get strong fires to keep steam to the required pressure. When the boiling was finished, the steam would rise and much of it would be wasted through the safety valves before the fires could be reduced. When the steam was wanted for the dyetubs down the steam would go again before you could get the hard coal fires to make what steam was wanted.

With soft coal you can handle the fires much quicker, and with a little care you will waste no steam through the safety valves, and can hold the steam from dropping when the dyehouse begins to draw. I soon found I could do as much with six tons of soft coal as I could with seven tons of hard in running a woolen mill and dyehouse.

One should never allow dead spots to get through the fires; with fires kept thin and even it is easily avoided. When I first went into a boiler house to have anything to do with the fires, I found that about all firemen had some different way of doing this work. Some wanted their fires made quite heavy, while others would get along with fires not as thick or heavy. Some would think they must break up their fires and clear them out four or five times a day and start them new. This caused a large amount of needless work, besides a waste of coal.

By experimenting and trying different ways of tending the fires, I soon found that with the fires kept at an even thickness of six inches over the whole grate surface, I could raise more steam with a ton of coal than I could with 1 1/2 tons, where the fires were kept at 12 inches, and, moreover, with less than one half the labor. Thick fires get clogged with cinders and ashes and have to be broken up and the dirt cleaned out, which is the hardest work a fireman ever has to do, while if six inches thick, the fires do not have to be broken during the whole day.

—The silence of the envious is praise enough.—Terence.

—The virtue that demands a reward has changed its name and called itself smartness.—J. Simon.

Picking and Carding.

VII.

BY SAM DRIVER.

(Continued from September.)

(Copyright, 1902, Guild & Lord.)

In my former article I promised to give the process of blending, oiling and picking a batch they had never seen in that mill before. One day the super came to me and said:—

"Sam, have you ever had any experience with any kind of hair mixes?"

I told him:—

"I have had lots of experience with all kinds of hair mixes."

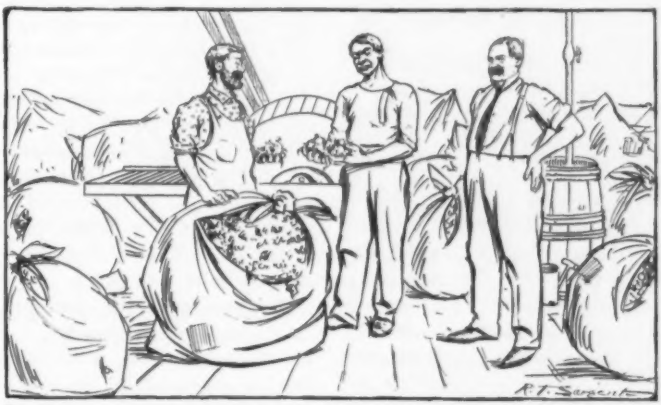
"What kind of hair would you think best to make 1 3/4 run backing?" he asked.

I told him I thought Kangaroo hair would be best. He said he thought so too. He then told me he had ordered some, that it had already arrived, and a portion of one bale had been colored black. He asked me what percentage of hair it would stand for 1 3/4 run backing. I told him 70 per cent.

"Well, Sam, I will weigh out a 500 lb. batch right away, and please get it on the cards as soon as convenient. It is for a sample and I have got the warp all ready."

This superintendent knew his business and did make money for the company. He weighed every lot himself and knew just what went in each lot. He also knew pretty near when such and such a card would run out from No. 1 set to 24th set.

When the men fetched the batch in the picker room, each one of the hands grabbed a handful of the stock and, looking at one another, wondered what kind of hair it was. One said it was cow hair; another said it was some kind of foreign hair and looked like monkey hair; the next said he would bet the beer it was dog's hair. At last George spoke and said:—



"I'LL BET A PINT OF PERUTS THAT HAIR CAME FROM BARBER SHOPS."

"I don't care a goll darn what you fellows call it, I will bet a pint of Peruts that hair came from barbers' shops."

That settled it, and we proceeded to mix the batch, which was composed of 350 lbs. black Kangaroo hair and 150 lbs. black wool of medium quality.

"Now, Bob, you take 150 lbs. of wool and run it through the duster and then through the bur picker. When all through, lay it down in front of mixing picker in three layers, sprinkling on each layer four quarts of oil and five quarts of water. Then

run through the mixing picker once. In the meantime, be running the hair through the duster; when ready make five layers of hair and five layers of wool, commencing with the hair, then the wool and so on alternately until finished. Beat well with pole. Run through three times, feed light and take from top to bottom of blend. Keep oil and water off the hair as much as possible. Twelve quarts of oil; fifteen quarts of water."

These orders were carried out and when the batch reached the card room we put it on the card at once.

(To be continued.)

The Textile Finishing Machinery Co.

The Textile Finishing Machinery Co. of Providence, R. I., has been organized to manufacture bleaching, dyeing, drying, printing and finishing machinery, and will after the 1st of October conduct the business heretofore carried on by the Granger Foundry & Machine Co., The Thomas Phillips Co. and The Rusden Machine Co. The new company has acquired all the interests formerly possessed by these concerns, including patterns, patents, tools, good will, etc. It has also acquired the controlling interest in the business now carried on under the name of the Phoenix Iron Foundry of Providence, R. I. The directors have elected as officers: President, H. Martin Brown; vice-president, Frederick C. Sayles, Jr.; secretary and treasurer, H. A. Tillinghast; general manager, E. A. Rusden; sales manager, Frederick I. Dana. The companies merged are large manufacturers of dyeing, bleaching and finishing machinery. We understand that it is the intention to specialize more than formerly the work of each plant, which will increase its efficiency and more thoroughly standardize the production. The active management of the company is in the hands of men who are thoroughly acquainted with the business and its requirements.

Production of Cotton Combers.

Editor Textile World:

I have read with interest the articles in the July and August issues upon calculating the production of cotton combers. Of all the machines in a cotton mill the comber is least adapted to the calculation of production from the speed.

We have nearly the same trouble with all frames, both ring, speeder, slubber or intermediate. The clock indicator certainly gives a good approximation and is sufficiently accurate for calculating the wages of the operators. With the comber, you may compute the number of nips per minute, the grains per nip, and so on, but there is nothing accurate enough about this, either to get at the real production or to pay the help by. So the only true way is to weigh the product or strike an average of the balls or laps turned off and multiply number of laps turned off by average weight of lap. Of course the weight of the lap will vary according to the kind of work and draft.

How to find the percentage of waste is a mixed question. Among the factors in the problem are the careless handling of the machine by an inefficient tender, the inability to regulate the temperature and humidity of the room, having one person take care of too much work, the neglect of the race-way, and, worst of all, a botch fixer who will always try to shift upon others the responsibility for the waste he has caused.

All this makes one kind of waste, but is different from the short fibre taken out by the comb. Suppose you have put through 906 pounds and have obtained 50 pounds of waste, then $50 \div 906 = 5.496$ per cent.

We sometimes hear: How much per cent. of short fibre should we take out for this or that kind of goods with a certain kind and grade of cotton? This can be answered only at the mill, where all the conditions are known.

PAUL.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market.

Interested parties are referred to the manufacturers for further information. These items are published without charge and regardless of advertising consideration, the idea being to present to our readers a systematic monthly record of new machinery, etc. of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

A New Special Sewing Machine for Hosiery. The Union Special Sewing Machine Co., 75 Kinzie St., Chicago, with branches in other cities, are now putting on the market a machine especially designed for hemming and covering the seam for hosiery. The machine is similar to their single Interlock machine for underwear. It possesses all the advantages of that machine in the way of elastic seaming, high speed, simplicity, etc. Its special advantage for hosiery lies in the fact that the work is fed over a horn, and the operative, therefore, feeds straight, instead of having to turn the work on a flat bed. This machine is designed for the class, of goods where the tops are turned and hemmed.

A New Knitting Machine for Sweaters and Similar Garments. E. H. Ludwig of Hawley, Pa., is introducing to this country a new line of German knitting machinery, for which he has taken the American agency. The machine for sweaters is fully automatic and designed for knitting plain, honeycombed and other fancy stitches. They are built to be run either by hand or steam power. One type of this machine is illustrated on another page of this issue of the Textile World.

A New Warp Compressor. James McCallum of Worcester, Mass., is putting on the market a new mechanism, by the use of which he claims that 20 to 40 per cent. more yarn can be put on to a warp beam. The yarn is not stretched, but retains its elasticitty. The device is entirely out of operatives' way. It can be adapted for any make of beaming machine, and is highly spoken of by those who have used it.

Full Fashioned Hosiery Knitting Machine. Dresdner Strickmaschinen-Fabrik, Irmscher & Co., Loebtau-Dresden, Germany, are introducing in the American market an automatic machine for knitting full fashioned hosiery and other goods. It combines the cotton and flat principles. It is made with any number of heads up to 12. It is claimed to be designed on an entirely new principle, which permits high speed, very large production, entirely automatic work, small needle breakage and ease on the yarn. It finishes the flat circular work with a double or cover heel fashioned on the machine, without any handwork before or after.

Oilless Bearings. The Carroll Oilless Bearing Company, 17 Hermon Street, Worcester, Mass., have placed on the market an improved bearing that requires no oil for its lubrication, the surface being of prepared wood. The bearings invented by Mr. Carroll are well known and have been in use for many years, and it is stated that the new device has been subjected to thorough tests to prove its superiority to the old style bearings. The new bearing has proved very satisfactory for spindles and drawing rolls.

A Clearer for Cotton Slubbing Frames. James Thomson, 169 Pine Street, Pawtucket, R. I., is about to place on the market an improved twin clearer for cotton slubbing frames which, it is claimed, results in the increased strength of the yarn, saving of rolls and prevention of bunches and waste in the slubbing.

DYEING DEPARTMENT.

Dye Recipes for October.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

Recipe No. 145.

Yellow on Cotton Yarn.

Dianil Yellow O O on 100 lbs. cotton yarn.

Prepare the dye bath with

2 lbs. Dianil Yellow O O.

(Victor Koechl & Co., 122 Hudson St., New York.)

30 lbs. Common Salt.

Enter at about 180° F., bring to a boil and dye at a boiling temperature for about one hour.

Dianil Yellow O O gives an excellent shade of yellow which meets all the usual requirements of fastness to light and washing.

Recipe No. 146.

Black on Worsted Yarn.

Sulpho Cyanine Black B on 100 lbs. worsted yarn.

Prepare the dye bath with

6 lbs. Sulpho Cyanine Black B.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Glauber's Salt.

5 lbs. Ammonium Acetate.

Enter yarn at 100° F., bring slowly to boil and then exhaust slowly with the addition of acetic acid.

Sulpho Cyanine Black B produces a bright bluish black, which possesses excellent fastness to light.

The fastness to washing and milling, and also to alkalies, acids, and carbonization is very good.

Recipe No. 147.

Red on Worsted Yarn.

Tyemond Red on 100 lbs. worsted yarn.

Prepare the dye bath with

3 lbs. Tyemond Red.

(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

10 lbs. Glauber's Salt.

Exhausting the dye bath with

5 lbs. Acetic Acid.

Enter yarn at 100 to 110° F., bring to a boil in one half hour, then dye at a boil for one half hour longer.

Tyemond Red possesses good fastness to milling, and does not lose in body or bleed into white wool milled along with it.

Recipe No. 148.

Brown on Worsted Yarn.

Anthracene Chrome Brown D on 100 lbs. worsted yarn.

Prepare the dye bath with

4 lbs. Anthracene Chrome Brown D.

(Cassella Color Co., 182 Front St., New York.)

10 lbs. Glauber's Salt.

3 lbs. Sulphuric Acid.

Enter at 140° F., bring to a boil in 20 minutes, and dye at a boil for one hour, then add

3 lbs. Potassium Dichromate

and continue the boiling one-half to three-quarters of an hour.

Anthracene Chrome Brown D gives an excellent shade of brown, possessing excellent fastness to light, washing and fulling.

Recipe No. 149.

Blue on Woolen Cloth.

Wool Blue B B on 100 lbs. woolen cloth.

Prepare the dye bath with

3 lbs. Wool Blue B B.

(New York and Boston Dyewood Co., 156 William St., New York.)

15 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid.

Enter the cloth at 170° F., bring to a boil and dye at this temperature one hour, exhausting the dye bath if possible.

Wool Blue B B produces a valuable shade of blue which is very useful neutral or union dyeing.

Recipe No. 150.

Blue on Worsted Yarn.

Azo Wool Blue B on 100 lbs. worsted yarn.

Prepare the dye bath with

4 lbs. Azo Wool Blue B.

(Cassella Color Co., 182 Front St., New York.)

15 lbs. Bisulphate of Soda.

Enter at 170° F., bring to a boil and dye at a boil for one hour.

Azo Wool Blue B produces an excellent shade of dark blue, which possesses excellent fastness.

Recipe No. 151.

Yellow on Worsted Yarn.

Tyemond Yellow G on 100 lbs. worsted yarn.

Prepare the dye bath with

3 lbs. Tyemond Yellow G.

(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

10 lbs. Glauber's Salt.

3 to 5 lbs. Acetic Acid (to exhaust).

Enter yarn at 104° F., bring bath to a boil in about one-half hour, and continue the dyeing at a boil for one-half hour longer, exhausting the dye bath as completely as possible.

In the dyeing of goods not easily penetrated it is well to add 5 lbs. of Acetate of Ammonia at the start, exhausting toward the end with Acetic Acid.

Tyemond Yellow G possesses good fastness to milling and stoving and ordinary exposure.

Recipe No. 152.

Blue on Cotton Yarn.

Benzo Fast Blue R on 100 lbs. cotton yarn.

Prepare the dye bath with

4 lbs. Benzo Fast Blue R.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Glauber's Salt.

2 lbs. Soda Ash.

Enter at 180° F. and dye at a boil for one hour.

For a direct cotton color, Benzo Fast Blue R possesses excellent fastness to light.

It is excellent for dyeing, cotton suitings, draperies and upholstery.

Recipe No. 153.

Red on Worsted Yarn.

Cloth Red 3 G A on 100 lbs. of worsted yarn.

First mordant the yarn in a bath made up with

3 lbs. Potassium Dichromate.

2½ lbs. Tartar.

Enter yarn at 130° F., bring to a boil and mordant at this temperature for 1½ hours.

Then dye in a bath made up with

3 lbs. Cloth Red 3 G A.

(Berlin Aniline Works, 213-215 Water St., New York.)

½ lb. Acetic Acid.

Enter yarn at 150° F., bring to a boil and dye at this temperature for one to one and one-half hours.

Cloth Red 3 G A produces an excellent and very fast red, and is valuable in the production of compound shades.

Recipe No. 154.

Orange on Cotton Yarn.

Mikado Orange G on 100 lbs. of cotton yarn.

Prepare the dye bath with

2 lbs. Mikado Orange G.

(C. Bischoff & Co., 88 Park Place New York.)

20 lbs. Common Salt.

Enter the yarn at 180° F., bring to a boil and dye at a boil for one hour.

Mikado Orange G dyes evenly, penetrates well, and possesses all the characteristic properties of the direct cotton colors.

Recipe No. 155.

Red on Cotton Yarn.

Tetrazo Red 12 B on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Tetrazo Red 12 B.

(New York and Boston Dyewood Co., 156 William St., New York.)

25 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Tetrazo Red 12 B gives an excellent shade of bluish red possessing the characteristic properties of the direct cotton colors.

Recipe No. 156.

Black on Worsted Yarn.

Acid Chrome Black J on 100 lbs. worsted yarn.

Prepare the dye bath with

7 lbs. Acid Chrome Black J.

(Sykes & Street, 85 Water St., New York.)

4 lbs. Acetic Acid.

10 lbs. Glauber's Salt.

Enter yarn at a temperature of from 160 to 180° F., bring to a boil and dye at a boil for one-half hour, then add

1 lb. Sulphuric Acid

and boil one-half hour longer.

Lift yarn, add

1½ lbs. Bichromate of Potash

and boil one-half hour longer.

Acid Chrome Black J gives excellent results on yarns to be milled and for piece goods. It can also be dyed as a plain acid color with Sulphuric Acid and Glauber's Salt.

Recipe No. 157.

Black on Cotton Yarn.

Carbide Black E on 100 lbs. cotton yarn.

Prepare the dye bath with

5 lbs. Carbide Black E.

(A. Klipstein & Co., 122 Pearl St., New York.)

25 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at a boiling temperature for one hour, keeping the bath as concentrated as possible during the operation.

Carbide Black E dyes even, penetrates well, and possesses all of the characteristic properties of a direct cotton color.

Recipe No. 158.

Dark Red on Worsted Yarn.

Anthracene Chrome Red A on 100 lbs. worsted yarn.

Prepare the dye bath with

3 lbs. Anthracene Chrome Red A.

(Cassella Color Co., 182 Front St., New York.)

10 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid.

Enter the yarn at 100 to 120° F., bring to a boil in twenty or thirty minutes, and after one hour add

2 lbs. Potassium Dichromate

and continue boiling three-quarters of an hour.

Anthracene Chrome Red A dyes very evenly, producing results fast to rubbing.

It is also very fast to washing and milling, strong acids and bleeding.

Recipe No. 159.

Black on Worsted Yarn.

Acid Chrome Black R on 100 lbs. worsted yarn.

Prepare the dye bath with

7 lbs. Acid Chrome Black R.

(Sykes & Street, 85 Water St., New York.)

4 lbs. Acetic Acid.

10 lbs. Glauber's Salt.

Enter yarn at a temperature of from 160 to 180° F., bring to a boil and dye at a boil for one-half hour.

Then add

1 lb. Sulphuric Acid

and continue boiling one-half hour longer.

Lift yarn, add

1½ lbs. Bichromate of Potash

and boil one-half hour longer.

Acid Chrome Black R gives excellent results on yarns to be milled and for piece goods.

Acid Chrome Black R can also be used in the usual manner with Sulphuric Acid and Glauber's Salt.

Recipe No. 160.

Orange on Cotton Yarn.

Mikado Orange S R on 100 lbs. cotton yarn.

Prepare the dye bath with

1 lb. Mikado Orange S R.

(C. Bischoff & Co., 88 Park Plate New York.)

15 lbs. Common Salt.

Enter at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Mikado Orange S R dyes evenly, penetrates well and possesses all of the characteristic properties of the direct colors.

Tests for Black on Cotton.

A dyer frequently receives samples of black cotton to be duplicated, and in such cases it is very desirable that he should know with what dyes the color was produced. There are six ways of coloring black on cotton: 1. Direct cotton black; 2. Developed black; 3. Logwood black; 4. Sulphur black; 5. Sulphur black topped with aniline black; 6. Aniline black.

The direct black is easily recognized by boiling the sample in water, which removes the greater part of the color from the fibre. The logwood black is also recognized by boiling in a dilute acid solution, which turns the black into a red. Developed black can be recognized by boiling in hydrosulphite, which permanently strips the colors, while colors made with aniline black and sulphur black, although partially stripped, regain the original shade by subsequent washing.

There remains the problem of distinguishing between aniline black and sulphur black topped with aniline. 1. The best method consists in soaking the sample in a 3° B. solution of chloride of lime just below the boiling point. Sulphur black will be completely bleached, while aniline black is converted into a brown; sulphur black topped with aniline ranges from pale yellow to a brown, according to the amount of aniline used to make the black. By a comparison with a sample made with the new quantity of aniline a rough estimate of the amount of aniline used in the new sample can be made. This method is very quick and reliable.

2. The sample is boiled in a solution of stannous chloride. The sulphur black is changed to an olive shade, while the aniline black survives with no apparent alteration. The sample is then boiled in hydrosulphate of soda, by which the aniline black, as well as the sulphur black, is stripped from the fibre; the aniline black quickly regains its original shade when taken from the bath and exposed to the air, while the sulphur black regains its shade but slowly. If the sample is soaked in bisulphate of soda the aniline black is made green, while the sulphur black is not changed.—Leipziger Faerber Zeitung.

Recent Developments in Coloring Matters.

From a Lecture by Prof. Otto N. Witt, Berlin.

The lecturer explained, with the aid of some striking experiments, that in order to become a dyestuff a substance must not only be so intensely colored that it could communicate its own shade to colorless substance holding it in solution, it must not only be soluble in water or other liquid suitable for preparing a dyebath, but it must also be soluble, and even much more soluble than in water, in the colloid which formed the substance of the textile fibre.

The finished dyed fabric was nothing more or less than a solid solution of the dyestuff in the substance of the fibre, unless there was secondary chemical influences, such as that of the mordants, at work which changed the solution into a suspension by precipitating the dyestuff after its immigration into the fibre.

This peculiar combination of solubilities was rare in colored substances

of an inorganic nature, and in the vast domain of organic substances of the aliphatic series few dyestuffs were met with, but in the aromatic series, where the power of selective absorption of light was very frequent, it would be curious if they were not of common occurrence.

Since the physical properties of every compound were direct functions of its molecular constitution, it was easy to believe that this peculiar combination of solubilities would be the result of certain general conditions fulfilled in many members of the aromatic group, and the theory he proposed twenty-five years ago was simply an attempt to discover those conditions by investigating the constitutional peculiarities of all those dyestuffs whose constitution was known in those days.

In the molecule of every coloring matter whose constitution was known certain atomic constellations had been observed, which seemed to be essential, and of which two must always be present—chromophores and auxochromic groups. Of the former some two dozen were known, all agreeing in the fact that they could not exert their influence except in the presence of the auxochromic groups, of which very few were known.

There must exist a law that governed the formation of chromophoric groups, but so far it had not been definitely established, though some progress had been made towards doing so. Our knowledge of the chemical causes of the physical properties of coloring matters was continuously developing, and quite lately some definite views had been formed about the connection of the chemical constitution of the aromatic bodies with that form of selective absorption of light brown as fluorescence.

Much work had been done on the constitution of the azo colors, the introduction of which was the direct result of early efforts to conduct the search for new coloring matters on definite scientific principles. The number of the dyestuffs of this class that might be prepared was extraordinary, and it had been computed that 3,159,000 different ones were at present easily accessible. Of these at least 25,000 formed the subject of patents in Germany and other countries, while over 500 were manufactured on the larger scale.

Azo dyestuffs could be produced at will to dye wool or silk or cotton, to dye slowly or quickly, and to stand soap, or acid, or alkali; and this possibility of adjusting their properties with almost mechanical precision had been the cause of the greatest successes of the color industry. But while this field bore its rich harvest, others were by no means neglected, though perhaps the greatest and most brilliant success of the chemistry of dyestuffs had been the industrial synthesis of indigo.

The study of these dyestuffs had become a domain of chemistry unsurpassed for variety and fascination; it taught a lesson even to those who were apt to look upon science as a pastime for those who lacked ability for practical life, for they could not help seeing that in this instance the most intricate science had led to something eminently practical and valuable.

H. S. Vila.

In our August issue the manufacturer's name was omitted from Recipe 118. Tokio Green B used for this recipe is sold by H. S. Vila, 115 South 2d St., Philadelphia, Pa.

—Frivolous people take frivolous things seriously.—Ctesse Diane.

—The tongue is an instrument the action of whose parts needs no stimulation.—Rivarol.

—What the multitude demands is mediocrity of the first order.—A. Preault.

MILL NEWS.

Cotton.

New Mills.

*Indiana, Evansville. A site has been purchased between Park and Devon streets for the new plant of the Lincoln Cotton Mills Company and work will start shortly on building.

*Massachusetts, Fall River. Work has been started by the Heywood Narrow Fabric Co. on erection of their new factory, replacing one destroyed by fire early this year.

*Massachusetts, Fall River. The grinding of the new cards for the No. 5 mill of the Fall River Iron Works Co., under construction, will start this week. This plant will have a total equipment of about 366,000 spindles and 10,200 looms when additions have been completed.

Mexico, Yucatan, Merida. A large cotton mill is under construction at this place, by local capitalists. It is expected that operations will be started in January.

*Mississippi, Magnolia. Work will start about October 1st on the new plant for the Magnolia Cotton Mills. It is expected to have mills ready to start production of goods April 1st, 1903. As was previously reported, will be equipped with 5,000 ring spindles and 150 looms, for cloth 38 1/2 wide. Contract for erection of the mill was let to W. T. Christopher, Columbus, Miss., September 10th.

New York, Glendale. A new building is under construction at this place for the Barthels Manufacturing Company, which will be removed here from Brooklyn. Company makes braids, glazed yarns and shoe and corset lacings.

*New York, Kingston. Ground has been broken for erection of new plant for the Brill Lace Mill.

*Pennsylvania, Philadelphia. Boothroyd & Webb, recently reported started operations, operate 3 looms on tapestry curtains, piece goods, couch and table covers. J. Boothroyd is superintendent of the plant and Geo. Webb, buyer. Goods are sold through O. L. Eisendrath, Chicago and Cowperthwaite & Lord, New York.

Pennsylvania, Philadelphia. Joseph Margerison, formerly with Greaves & Bro., has recently started a plant in Frankford, for manufacturing Turkish towels.

*South Carolina, Anderson. Plans and specifications are being prepared for the Toxaway Mills, recently reported incorporated with capital stock of $225,000. J. A. Brock, E. A. Ledbetter, F. G. Brown and T. C. Jackson are also interested in the concern. Equipment will consist of 10,000 spindles and 325 looms for making brown sheetings.

*South Carolina, Anderson. Work is well under way on construction of the new buildings for the Brogan Cotton Mill. It is expected to have the plant ready to start production of goods Sept. 1, 1903. The weave room will be built with a saw tooth roof. R. E. Ligon, vice-president and treasurer and R. L. Cumnock, superintendent, are personally superintending erection of the plant.

*South Carolina, Clinton. Work is being pushed on construction of the Lydia Cotton Mill, which expects to have the plant in operation by November 1st. This plant will be equipped with 5,000 spindles and 150 looms.

*South Carolina, Greenville. Contracts have all been awarded for erection of the new mill for the American Spinning Company. This mill will be equipped with 15,000 spindles and 310 (Draper) looms, increasing the total number of spindles and looms to 36,000 and 660, as previously reported. Fine sheetings will be made. Contracts have not yet been placed for the electric plant, heating equipment and sprinkler system.

*South Carolina, Greenville. Work has been started on construction of the Woodside Cotton Mills, which have been incorporated with capital stock of $300,000; John T. Woodside, president; H. F. McGee, vice-president and J. D. Woodside, secretary-treasurer. The plant will be equipped with 10,500 spindles and 300 looms for making light weight fancy goods.

*Tennessee, Knoxville. The brick work has been started on the new mill under construction for the Brookside Mills, about which previous mention has been made.

*Texas, Brenham. Contract has been let to the Lowell Machine Shop for the machinery equipment (5,000 spindles and 160 looms), of the Brenham Cotton Mills. Work will be pushed on construction of the buildings and machinery installed as soon as possible.

Enlargements and Improvements.

Alabama, Florence. A dye house has been added to the Ashcroft Cotton Mills.

*Georgia, Beverly. The Pearl Cotton Mills will install 120 looms and other cloth machinery in their plant. They have been operating 7,500 spindles on yarns, but will now use the yarn product.

*Georgia, Canton. Operations have been started up in the dye plant, recently installed in the Canton Cotton Mills. The plant is now in operation making blue denims.

*Georgia, LaGrange. The Park Mills are reported in the market for building materials, sprinkler equipment, dye tubs (chain dyeing), drying cans, underwriters' pump and 100 h. p. Corliss or automatic engine.

Massachusetts, Fall River. The Massasoit Manufacturing Co. is to build a new storehouse, 50 by 69 feet.

Massachusetts, Fall River. A stone addition, 60 by 90 feet, is to be built to the cloth room and storehouse of the Wampanoag Mills.

Massachusetts, New Bedford. The Dartmouth Mill Corp. is to build an addition to the cloth room, 50 by 184 feet, one story.

*Massachusetts, Pittsfield. It is expected that the new buildings under construction for J. L. & T. D. Peck Mfg. Co., for manufacturing insulating thread, will be ready early in October. Geo. L. Waring is the new superintendent and general manager of the plant.

North Carolina, Charlotte. Sixty thousand dollars' worth of preferred stock will be issued by the Ada Yarn Mill and a number of looms will be installed.

New York, Utica. Work has been started on the erection of a new mill, 93 by 173 feet, two stories, for storage and manufacturing purposes, for the Utica Steam and Mohawk Valley Cotton Mills.

Pennsylvania, Philadelphia. A new brick mill, 56 by 200 feet, five stories and basement, is to be built by Henry Schadewald, Third and Huntington streets.

South Carolina, Gaffney. The Gaffney Manufacturing Company has increased the capital stock from $800,000 to $1,000,000.

South Carolina, Greenville. It is reported that the Monaghan Mills contemplate making some additions and improvements to the plant next spring.

South Carolina, McColl. The McColl Manufacturing Co. is to increase the capital stock from $200,000 to $230,000, for purpose of increasing in the machinery equipment.

*South Carolina, Union. The Monarch Cotton Mills, recently reported to increase the capital stock to $750,000, have done so and a new building, 135 by 140 feet is under construction. They will install 26,000 spindles and 640 looms in the new addition, which, when completed, will give them a total of 40,000 spindles and 1,000 looms.

Mills Starting Up.

*Rhode Island, Lafayette. Operations have been started in the Shady Lea Mill of the Rodman Mfg. Co. and it is thought the other mills will soon be running. New machinery is being placed in the Lafayette Mill.

*Tennessee, Trenton. Operations have been resumed with full force of operatives, in the Trenton Cotton Mills.

Mills Shutting Down.

*Virginia, Petersburg. There is small prospects of the Ettrick Manufacturing Co. resuming operations. The question of sale has been remanded to court and there is no knowing when matter will be settled.

Woolen.

New Mills.

*Maine, Waterville. Work is being pushed as rapidly as possible on the construction of the Chase Woolen Co.'s new mill. A water wheel has been purchased and will soon be installed, with other machinery which Mr. E. Chase has been buying. It is hoped to begin manufacturing before a great while.

Massachusetts, North Oxford. The Chase Mill, recently operated by the Glen Woolen Co., which has been running the plant with frequent closings, has been purchased by Weise & Nichols, of New York. The machinery is being overhauled by the new owners, who will manufacture fancy woolen goods and suitings. Goods will be sold direct. A New York office will be opened in the fall some time, under charge of Mr. Nichols, formerly in the Holmes department of Oelbermann, Dommerich & Co.

*Minnesota, New Duluth. The Duluth Woolen Mill Company has been formed to operate the mill previously reported proposed at this place. H. K. Terry of Rochester, Minn., will have charge for the company. The building which they will occupy will accommodate six complete sets of woolen machinery and 36 broad looms, but operations will only start with about a third and increase as business warrants. A large portion of the goods will be made up into trousers and mackinaw jackets.

New Jersey, Clementon. The Abel Bottom mill at this place, has been leased by Geo. Barber, wool and cotton waste manufacturer, of Philadelphia. The building is equipped with machinery for ravelling textile fabrics and making railroad and other waste.

*New Mexico, Albuquerque. J. H. Bearrup will add more machinery to that recently reported purchased from the Stockton Woolen Mills and put same in operation.

*Nova Scotia, Amherst. The new woolen mill contemplated by Harry Hewson, at Truro, will be located at this place. Company has been formed with capital stock of $100,000; H. L. Hewson, president and general manager; E. E. Hewson, vice-president and E. J. White, secretary and treasurer. The main building to be erected will be 155 by 56 feet, four stories, with power house, 40 by 40 feet. Dye house, storage buildings, etc., will also be built. Plant will be equipped with about 5 sets of modern machinery for making high grade woolens. Work has been started on foundations. Mr. Hewson was formerly superintendent at Oxford, N. S., and made a great success of that mill.

*Ohio, Jackson. L. L. Creasey is president and J. P. Henry (Jackson, O.), treasurer of the Jackson Woolen Mills Co., operating machinery removed from Covington, Ky. Company will be capitalized at $30,000. They will operate 3 sets cards and 10 broad and 5 narrow looms, using steam power, making blankets, skirting cloths, cassimeres, meltons, etc. Dye house is attached to the mill.

Pennsylvania, Philadelphia. A. J. Cameron & Co., American and Dauphin Streets, will soon receive estimates on new mill to be erected at Frankford Junction. Plans and specifications are now being prepared for a building 75 by 400 feet, brick, equipped with modern machinery.

*Tennessee, McMinnville. The McMinnville Woolen Mills Company has been incorporated with capital stock of $30,000, to operate the plant of the Tennessee Woolen Mills, whose plant was recently sold. M. T. Boss, S. G. Stratton, Alex. Young, Wm. Boss, R. Houston Dudley, Jr. and B. J. Turner, are the incorporators. New machinery will be purchased and the plant put in good repair.

*Wisconsin, Grafton. The Badger Worsted Mills, previously mentioned, have a capital of $100,000. D. Wittenberg, Jr., is president, and Wm. J. Roebken, treasurer, general manager and buyer. The building is nearly completed, but the machinery is not yet all bought. They expect to get into production in January, making worsted yarn for knitters and bundle yarn from 4s to 40s. They will use water power. There will be a dyehouse, and they will employ English system of machinery, and will have two combs, two worsted cards and about 700 spindles. Sell direct. Mr. Roebken has been superintendent of the Cedarburg Woolen & Worsted Mills for the past 20 years, and is well known to the trade.

*Wisconsin, Prairie du Chien. The Prairie du Chien Woolen Mills, recently destroyed by fire, will be rebuilt. They are in the market for necessary equipment.

Enlargements and Improvements.

California, Eureka. A spinning frame of 360 spindles and four new looms have recently been installed in the Humboldt Woolen Mills and are now in operation.

*Kansas, Topeka. Work will start shortly on building of the addition to the Western Woolen Mill Co.'s plant, lumber having been received.

Maine, Camden. A new flume is to be built for the Knox Woolen Mill and larger water wheel installed, with other repairs. The mill has been closed for about three weeks during the alterations.

Maine, Pittsfield. Work has been about completed on the new building started last spring for the Pioneer Woolen Mills. All the wet finishing machinery is located here. Much of the machinery now in the old part of the mill will be put in the new addition, 58 by 130 feet, now under construction. New machinery will be added, making it a complete 16 set mill instead of 12 set.

*Maine, Sanford. Work is nearly completed on the new brick building under construction for the Goodall Worsted Co. Several machines are in operation on the first floor, which is an extension of the combing room. The second floor will be filled with looms, which will soon be installed. The finishing department will be on the first floor. Work has been started on the foundation for an 800 h. p. engine.

Maine, Skowhegan. The Marston Worsted Mills are installing twelve new looms in the East Madison plant.

Massachusetts, Blackstone. The Saranac Mills are reported to install fifty or sixty new looms to take place of those taken out some few months ago and transferred to another plant of the American Woolen Co. There are now about 160 looms in the plant.

*Massachusetts, Lawrence. Operations will soon be started in the Butler Mill, recently purchased by E. Frank Lewis, wool scourer. The mill will be operated independent of the other plant.

Massachusetts, Unionville. Ground has been broken for the erection of a new shoddy mill to be built here by Geo. R. Whitin, operating the Mendon Woolen Mills, at Mendon, to be run in connection with the old plant. It is expected to start operations in the new building in about three months.

Massachusetts, Uxbridge. The Waucantuck Mills, C. A. Root & Co., proprietors, are installing six new broad Knowles looms in their plant, to meet their increasing orders.

New Hampshire, Penacook. The Dustin Island Woolen Mills contemplate building an addition to the dyehouse.

New Hampshire, Tilton. New looms are to be installed in the Elm Mills Woolen Co.'s plant and will be put in operation as soon as they are placed.

New York, Seneca. The Seneca Woolen Mills, which have installed considerable machinery of late in the mill, contemplate making further improvements.

Nova Scotia, Oxford. The Oxford Manufacturing Company is reported to double the capacity of the present plant by erecting a new mill.

Ohio, Cleveland. The Cleveland Worsted Mills company has completed the erection of a new addition, 250 by 90 feet, six stories and basement, and installed the spinning and twisting machinery. A new boiler house, 86 by 84 feet, one story high, is also under construction. Eight Sterling boilers and a 1,200 h. p. engine will be put in. About 60 more looms will be added.

Pennsylvania, Philadelphia. A new building, two stories, is under construction for Chas. B. Krause, manufacturer of carpets.

Pennsylvania, Philadelphia. The spinning machinery operated by Baltz Bros., Manayunk, has been purchased by W. S. Davis.

Rhode Island, Peace Dale. The extensions to the plant of the Peace Dale Mfg. Co. are approaching completion. The old finishing mill will be filled with additional worsted machinery and an entirely new finishing department has been built, as well as other extensions. When the plant is finished, it will contain about 300 looms.

Utah, Provo City. A brick addition, costing about $15,000, will be built to the main plant of the Provo Woolen Mills Co. The annex will be used for weaving purposes.

Vermont, Bennington. An addition, 48 by 105 feet, is being built to the dressing department of Holden, Leonard & Co.'s mill.

Mills Starting Up.

*Kentucky, Louisville. John Nightingale is superintendent of the Eclipse Woolen Mills, which have been put in operation. The goods are to be shipped

to Indianapolis, another mill owned by Mr. D. A. Chenoweth, where it will be made into trousers.

Mills Shutting Down.

Minnesota, Rochester. The Rochester Woolen Mills, which operated a three-set plant and also machinery for making goods up into men's pants, are closed down, and the plant is advertised for sale. Mr. Terry, who was formerly manager of this plant and one of the promoters of the mill, is organizing a new mill at New Duluth.

*Pennsylvania, Darby. Both mills of the Griswold Worsted Company, whose charter has expired, have been closed indefinitely. An effort is reported being made to organize a new company, but property must first be sold.

*Rhode Island, Washington. The Livingstone Woolen Mills, which have been in the hands of Thomas J. Jeffries, receiver, for some months, have been closed indefinitely. It is not known whether the plant will be put in operation next January.

Knit.

New Mills.

*Minnesota, Minneapolis. Operations have been started by the Twin City Knitting Co., capitalized at $50,000, making sweaters, tights, golf hose, jackets, etc. They are operating six knitting machines and one sewing machine. Eugene M. Stevens is president of the company, Herman Schwartz treasurer and superintendent. F. E. Parsons is buyer for the company. The plant is operated by electricity. Goods are sold direct.

*New York, Depew. It is expected that work will start early in September on the new building for the Depew Knitting Company, which has begun operations in leased quarters.

*New York, Mattewan. The Gordon Mesh Underwear Co., recently reported organized with capital stock of $10,000, contemplates starting operations October 1st, making men's, women's and children's knit goods. E. O. Rose is president and treasurer of the concern and C. O. Terwilliger, superintendent. They will operate 17 knitting and 15 sewing machines, using steam power. A dyehouse will be attached to the plant. Robischen & Peckham will sell the goods.

*New York, New Hartford. Samples are now being made at the Maxwell Manufacturing Company's mill.

New York, Oswego. The Nottingham Knitting Company has been incorporated with a capital stock of $2,500, for the purpose of manufacturing glove linings. Thomas D. White is president of the company and Thomas N. White secretary. Mr. Thomas D. White was formerly connected with the Swits Conde Co., and will have charge of the new mill. The building formerly occupied by John Lennox as a steam laundry has been leased for the purpose. They expect to start operations in a few weeks, employing about twenty-five people.

New York, Rochester. Site has been purchased on Clinton Avenue, South, by Max Lowenthal & Bro., who will erect a new mill, three stories, of slow-burning construction. The mill will be equipped with latest improved machinery, electricity and automatic sprinkler system. An addition, one story, will be built for the boiler, bleach and dry house. It is expected to have the new mill ready for occupancy in the spring of 1903.

*New York, Syracuse. Work will start on the foundations of the new mill to be erected by the Clinton Knitting Co. about October 1st. They propose building a large storage house in connection with new mill and boiler and engine houses. The main plant will be 240 by 50 feet, four stories high.

*North Carolina, Elkin. The Elkin Knitting Mills have been recently incorporated with capital stock of $10,000, with Thos. J. Lillard as president, to manufacture men's, women's and children's hosiery. The equipment is to consist of 20 knitting machines and one sewing machine and is to be operated by steam; have not fully decided all particulars, but hope to build this fall, with a view to having the plant in operation about Jan. 1, 1903.

*North Carolina, Kernersville. Lowrey Hosiery Mills will be the name of the new knitting mill at this place, previously mentioned. Lowrey Son & Co. are the proprietors. It is not a new firm; they have previously been in other business, although new to the knitting business. They have just started, making 84 needle half hose, white heel and toe, and are now running 12 machines, but may start more later. They use steam power. No dyehouse. They have not yet arranged for selling agents. J. A. Ruth is superintendent.

*North Carolina, Tryon. At meeting recently held by those interested in the knitting mill project, A. D. Beatson was elected president of the company; T. T. Ballenger, vice-president and F. P. Bacon, secretary and treasurer. A committee comprising Messrs. Maj. Strong, Dr. Grady and T. T. Ballenger has been appointed to make investigations concerning details, etc., for the plant.

*Pennsylvania, Allentown. The Novelty Hosiery Co. expects to have their new mill, under construction, in operation Oct. 1st. The main building is to be 112 by 40 feet, brick, three stories. About 40 machines are in operation in their warehouse, to fill orders received. Men's fancy half hose in Jacquard patterns are made.

Pennsylvania, Fleetwood. Madeira & Wanner, operating a hosiery mill at Lyons Station, have let contract to D. R. Deisher, for erection of a new plant at this place.

*Pennsylvania, Mechanicsburg. The Blue Ridge Knitting Co., Hagerstown, Md., reported as contemplated establishing a branch mill at Harrisonburg, Va., state that this is not so. Members interested in the concern, though, are starting a new plant at this place, as the Black Rock Knitting Co., with main office at Hagerstown, Md. They will start with about 50 knitting machines, making misses' ribbed hose and employing about 80 people. The company has not yet been incorporated nor officers elected.

Pennsylvania, Philadelphia. Proposals are being received by B. W. Fleischer and Maurice Pfoelzer for building a hosiery mill, 200 by 62 feet, three stories, brick, with an ell 58 by 42 feet, and a one-story boiler and engine house, 36 by 94 feet.

Pennsylvania, Pottstown. The Pottstown Knitting Company, manufacturers of ladies' hosiery and men's half hose, has purchased a lot, corner High and Manatawny Streets, and will start work at once on erection of a new mill, 100 by 40 feet, three stories. Plans are now being prepared and contracts will be let as soon as possible, as they desire to have same ready for occupancy January 1st. New plant will have capacity for 250 machines.

Wisconsin, Milwaukee. A new company has recently started operations at 612 East Water Street, this place, making cardigan jackets and sweaters. Concern is known as Victor Montwid & Son.

Enlargements and Improvements.

*Georgia, Rossville. Machinery is being installed in the new addition upon which work has recently been completed for the Richmond Hosiery Mills. Operations will probably be started this week. The old mill will be used as a stock room and warehouse.

Massachusetts, Lowell. The Lowell Hosiery Co. has recently completed erection of a new dye house, 50 by 80 feet, and equipped same with new machinery.

*Massachusetts, Shelburne Falls. D. E. Farley of the Orange Knitting Co., Farley, Mass., has secured possession of the old silk mill and will probably make this place their headquarters.

Minnesota, Mankato. About $30,000 is being expended by the Mankato Mills Co., on machinery additions to the plant, including 100 new Invincible knitting machines. The output will be about 800 dozen per day when additions have been completed.

New York, Fort Plain. Chas. Bailey & Sons have purchased the knitting machinery in the mill at Middleville, which is being remodelled for manufacture of felt. They are building an addition to the plant in which the equipment will be installed.

New York, Owego. Julius Kayser & Co., of Brooklyn, are reported to establish a silk glove factory at this place and that a large building has been leased for the purpose.

New York, Utica. A site has been purchased by the Regal Textile Co., for purpose of building a new mill, present quarters being inadequate.

Pennsylvania, Clifton Heights. The Columbia Knitting Co. is making some additions to the mill. They are moving the building which they first occupied to location near the present plant.

Pennsylvania, Honesdale. The Maple City Knitting Mills, manufacturers of sweaters and cardigan jackets, are to add four or five new machines to the equipment.

Pennsylvania, Reading. The Stork Knitting Mill is to be enlarged. The rear of the present plant, which is one story, will be raised to three stories and will be equipped with an elevator, engine room, etc. They make men's medium half hose.

New York, Elmira. An addition is to be built to the Queen City Knitting Mill, R. G. Jennings, proprietor.

Pennsylvania, South Bethlehem. A building adjoining the plant of the Excelsior Knitting Mills, Geo. D. Dobbins, proprietor, has been purchased and the capacity of the plant will be increased 1,500 dozen more a week. New machinery is to be installed, and it is expected to be in full operation by January 1st.

Pennsylvania, York. Jos. Black & Sons Co., manufacturers of hosiery, are installing additional machinery in the mill.

*South Carolina, Newberry. Contract has been let by the Newberry Knitting Mills for the installation of a dye plant.

Mills Starting Up.

*New York, Boonville. Operations have been started in the Boonville Knitting Mill, of which C. K. Wilkes is superintendent.

Vermont, Bennington. Operations have been resumed in the Bennington Knitting Mill, which has been closed for several weeks.

Silk.

New Mills.

*Connecticut, Norwalk. Loth & Company, of New York, who have started work on construction of their new mill at this place, expect to have the building ready for occupancy about February 1st.

*Massachusetts, Fitchburg. Cornforth & Marx, who removed their plant to this place from Paterson, N. J., have about 30 looms in operation. There are about 60 looms in the mill which will be put in operation as soon as weavers can be secured. The finishing is now done at Paterson, but as soon as company can do so, a finishing plant will be installed in the mill.

*Massachusetts, Milford. The Milford Silk Co. has been incorporated, as per previous report, to operate the mill formerly occupied by the Magid-Hope Silk Mfg. Co. George Otis Draper is president of the company and Jesse A. Taft, Milford, treasurer. The capital stock is placed at $300,000.

*New Jersey, Middletown. Edward Sargent, manufacturer of silks at Paterson, N. J., is to start up a mill at Middletown, and not Sussex, as previously reported.

New Jersey, Passaic. William H. Wettlaufer, George Wettlaufer and Chas. G. Frautwein have incorporated the Hoboken Ribbon Co., with a capital stock of $20,000, for the purpose of manufacturing silk goods. The principal office will be at 200 Lexington avenue.

*New Jersey, Paterson. The Hill Silk Manufacturing Company has started operations in their new mill, although the complete equipment has not yet been installed. Company is capitalized at $15,000; William S. Hill, president and I. W. Howell, treasurer. Dress silks are made and sold through S. J. Hall, New York. Plant is operated by electricity.

New Jersey, Paterson. A warping and winding plant will be established shortly on West 27th Street by Cooper Bros.

New Jersey, West New York. Messrs. Griffith, Herman and LeBert de Bar are to lease a plant, now under construction, for purpose of manufacturing silk. It is expected that the mill will be running by the first of December.

*Ohio, Marion. The building for the Susquehanna Silk Mills is nearly completed, and work will soon start on the installation of the electric plant, company to manufacture its own electricity.

Pennsylvania, Blakely. Alfred Harvey, operating a silk mill at Scranton and Forest City, is to establish a branch mill at this place.

*Pennsylvania, Jersey Shore. Contract has been let and work started on construction of the new silk mill at this place.

*Pennsylvania, North Wales. The new mill soon to be put in operation here by Charles Stringer, will be for yarn finishing and silk and cotton spooling.

Pennsylvania, Philadelphia. Operations have been recently started in the new building on Allegheny avenue, by the Colonial Plush Mills, manufacturing velvet piece goods, curtains and table covers.

*Pennsylvania. Scranton. Work has been started on the construction of the new silk mill to be established here by W. H. Ashley of Hackettstown, N. J. The building will be 15 by 55 feet, two stories, of wood and iron.

*Virginia, Newport News. Work is expected to start about October 1st, on the new silk mill projected at this place.

Enlargements and Improvements.

*Connecticut, Mystic. The addition to the Rossie Velvet Mill has been completed and the work has begun installing the machinery. Three looms have already been placed in position.

*New Jersey, Paterson. The Julius Brandes Manufacturing Co. is not building a new dyehouse, but an addition to their present one.

New York, Delhi. The Delhi Silk Co. will install 50 more looms in the plant, as soon as sufficient operators can be had.

*New York, Deposit. When the Caspers Silk Co. completes installation of additional looms in the Leonard Mill, they will have a total at that plant of 62. They will also add 56 more to the Paterson plant. A new mill is to be built next April and equipped with 150 or more looms.

New York, West New Brighton. A new two-story building is to be built, for the Empire State Label Company, A. K. Buhl, proprietor, for the purpose of increasing the capacity of the plant. A number of new looms and other machinery will be installed.

New York, Hornellsville. The Merrill Silk Co. has been incorporated by B. C. DeWitt, Elizabeth Merrill (Hornellsville) and W. M .Field, (Philadelphia) with capital stock of $50,000. The company will receive bids for the erection of two new buildings, 115 by 26 feet and 112 by 43 feet, brick, with slag roofs.

*Pennsylvania, Danville. Work has been started on the foundation of the addition to the F. Q. Hartman's silk mill. The addition, which will be of brick, will contain the offices and also office of the Colonial Spinning Mills, at Berwick, Pa., in which Mr. Hartman is interested. Additional machinery will be placed in the main building, the building of new addition now making this compatible with their plans.

*Pennsylvania, Swarthmore. Work is nearing completion on the erection of a new addition for the Victoria Plush Mill, and it is expected that the same will be ready for occupancy in about three weeks.

Pennsylvania, White Haven. The White Haven Silk Co. has awarded contract for the erection of an addition, 24 by 16 feet, to the mill.

Mills Starting Up.

*Connecticut, Norwich. Work has been started in the Owaneco Silk Mill, leased by Givernaud Bros. About twenty-five looms have been placed in position and are ready to operate.

*New York, Buffalo. Operations have begun in the branch mill established here by the Duffy Silk Co., operating mills at Phenix and Fort Plain.

*Pennsylvania, Hamburg. Operations have been started in the new mill established here by the Hamburg Silk Company.

Miscellaneous.

New Mills.

Massachusetts, Andover. The Smith & Dove Manufacturing Co. is building another story to their batch house, 100 by 40 feet, in which a new system of preparing machinery will be installed. An addition is also to be built to the boiler house and two new boilers installed.

*Pennsylvania, Allentown. Work is nearing completion on the addition to the Allentown Spinning Company's mill. About 1,500 new spindles will be installed and put in operation, besides the machinery which is to be put in the first floor for converting jute (raw material) into yarn, previous to being made into different sizes.

*Pennsylvania, Scranton. M. F. Sands is president; W. L. Schlager, treasurer and William Menzies, superintendent of the Scranton Yarn Finishing Company, which starts operations this month. Capital stock is placed at $50,000. They will mercerize, bleach, dye and cone all kinds of cotton yarn. Use steam power.

PERSONAL RECORD.

Cotton.

Arthur E. Benson has resigned as boss weaver for the Atlas Linen Co., Meredith, N. H., and is now in Pawtucket, R. I.

William H. Buckley has severed his connection with the Baltic Mills Co., Baltic, Conn., to accept the superintendency of the new mill of the Coosa Mfg. Co. at Piedmont, Ala. This mill will contain 10,000 spindles for spinning yarns from 40s to 80s of combed Egyptian and Peeler cottons. It will contain only the best and most modern machinery, being especially equipped for making hign grade yarns. Mr. Buckley's successor at the Baltic Mills is George F. Haling.

J. W. Black, superintendent of the Pepperton Cotton Mills, Jackson, Ga., has resigned to accept a similar position with the Bamberg Cotton Mills, Bamberg, S. C.

Charles A. Burns of Manchester, N. H., is now with the Samson Cordage Works, Boston, Mass., as cotton spinner, spooler, warper and twister.

John Brennan, overseer of carding of the Cohannet No. 3 Mill, Taunton, Mass., has resigned. The help employed under Mr. Brennan presented him with a solid gold chain and charm, the presentation being made by Henry Masterson.

Gilbert P. Cutler has resigned the superintendency of the Border City Manufacturing Co.'s mill, Fall River, Mass., on account of ill health.

W. Dootson, after a continuous service of 20 years, has resigned the superintendency of the Athens Manufacturing Company of Athens, Ga.

John Denton has accepted the position of superintendent of the Vance Cotton Mills, Chattanooga, Tenn.

Walter Dootson has been engaged to succeed his father, William Dootson, as superintendent of the Athens Mfg. Co., Athens, Ga.

J. L. Eddleman is superintendent of the Bamberg Cotton Mills, Bamberg, S. C., succeeeding J. T. Cartee, who has accepted a position with the Draper Company, Hopedale, Mass.

J. D. Farr has been engaged to succeed O. H. Farr as superintendent of the Walton Cotton Mills, Monroe, Ga. O. H. Farr has accepted the superintendency of the Witham Cotton Mills, Hartwell, Ga.

Z. V. Gray is overseer of spinning and twisting at the Chronicle Cotton Mills, Belmont, N. C. He was formerly employed by the Monroe Cotton Mills, Monroe, N. C.

E. Gaillard is now boss spinner for the Fairfield Cotton Mills, Winnsboro, S. C.

James L. Harring, one of New England's brightest ring spinners, has been transferred from the Howland Mills to the Bennett Spinning Co., New Bedford, Mass. He has been at the Howland Mills but a short time and has won the respect and esteem of his help, and before the closing hours of his labors they presented him with valuable presents.

J. W. Horner has accepted a position as dyer with the Canton Cotton Mills, Canton, Ga.

T. Harry Hornby, several years machine printer for the United States Finishing Co., Pawtucket, R. I., has become foreman printer for the Dunnell Print Works, Apponaug, R. I.

Albert Holmes has resigned as overseer of carding for the Dexter Yarn Company of Pawtucket, R. I., to work for the Valley Falls (R. I.) Company.

John H. Holt, formerly overseer of carding in New Bedford for the Wamsutta Mills, has succeeded D. Wright as superintendent of the Totokett Mills, Norwich, Conn.

W. P. Hurt has accepted the position of overseer of carding with the Florence Cotton Mills, Forest City, N. C.

Samuel Holt has accepted the position of designer with the Boott Cotton Mills of Lowell, Mass.

T. J. Halloran of Mays Landing, N. J., has been appointed overseer of carding in W. C. Plunkett & Sons cotton mill at Adams, Mass. He succeeds W. E. Davis, who resigned to take a position at the Berkshire Mills in Adams.

W. P. Kelly, of Nashville, has been appointed by the directors of the Tipton Cotton Mills of Tipton, Tenn., superintendent of the mills. Mr Kelly has been for some time superintendent and manager of the Phoenix Cotton Mills of Nashville.

C. J. Kennett, superintendent of the Forsyth Mfg. Co., Forsyth, Ga., has resigned.

William Lilly has resigned his position at the Thistle Mills Co., Ilchester, Md., and expects to take a similar situation with a Baltimore firm.

Ferdinand Leclare has been appointed overseer in the spooling, spinning, warping and twisting department in the Otis Co.'s No. 2 Mill, Ware, Mass.

John F. Minnick of Thorndike, Mass., has accepted the position of overseer of weaving and designing with the Sibley Mfg. Co., Augusta, Ga.

John V. Orrell, who has been connected with the Coulter & Lowry Co.'s finishing mill at Greensboro, N. C., is now with the Ossipee Cotton Mills, Elon College, N. C. He has charge of the packing, shipping and receiving departments.

Antoine Roy, Natick, R. I., has accepted the position of secondhand carder with the Eclipse Mill, North Adams, Mass.

Overseer George N. Reed of the Merrimack Mills, Lowell, Mass., for many years connected with this corporation, has resigned.

J. A. Rountree has resigned his position with the Jackson Fibre Co., Bemis, Tenn., to take charge of carding and spinning for the Hillsboro Cotton Mills, Hillsboro, Texas.

John J. Shay, who has been master mechanic at the Border City Mills, Fall River, Mass., for about 20 years, has been promoted to the position of superintendent. He will take the place made vacant by the resignation of Gilbert Cuttle.

H. G. Smith, late of the Olympia Cotton Mills, Columbia, S. C., has accepted the position of overseer of weaving, spooling, warping, slashing and drawing-in with the Glen Lowry Mfg. Co., Whitmire, S. C.

W. L. Towne of Ware, Mass., succeeds L. S. Brown as overseer of weaving for the China Mfg. Co., Suncook, N. H.

William Tallant, for many years overseer of the weaving department at the mill of the Boston Manufacturing Co., Waltham, Mass., has resigned to accept a position as superintendent in one of the mills at Fall River.

P. D. Wade, who has been assistant superintendent of the Pelzer (S. C.) Manufacturing Co., is now superintendent of the plant, succeeding B. F. Guy. The latter has succeeded L. E. Anderson as superintendent of the Eufaula (Ala.) Mills.

J. Frank Towle, overseer of weaving at the Manchester Mills, Manchester, N. H., has been succeeded by William S. Brice, who has had charge of the weaving department of the Langdon Mills. Mr. Towle, who has been overseer at the mills for over twenty years, was presented by his employees with a watch, chain and charm and a purse of $100 in gold.

Woolen.

Charles Andrews has resigned as overseer of carding for the Titus Flannel Company, Poughkeepsie, N. Y.

William Ambeck, overseer of finishing in the Saranac Mill, Waterford, R. I., has resigned to take a position with a woolen concern in Philadelphia.

T. F. Brennan has resigned as overseer of the carding department at the American Woolen Co., Winooski, Vt., and accepted a position in East Dedham, Mass. His departure is much regretted by his many friends in the mill.

R. A. Bain of Harrisville, N. H., has become overseer of spinning for the Merchants Woolen Company, East Dedham, Mass.

Charles Bromley, New London, Conn., has been engaged as boss carder by the Andrews & Smith Woolen Company, Norwalk, Conn.

John Bentz of Worcester succeeds James Hogan as boss dyer for the Warren Woolen Company, Stafford Springs, Conn.

Michael Burns, late boss carder for Cole, Senior & Co. of Medway, Mass., has secured a position in Oxford, Mass.

Joseph Cameron is the designer at the Newport Woolen Co., Newport, Me., having succeeded D. P. Warwick. The latter is the new assistant superintendent and designer at the Cowan Woolen Co., Lewiston, Me.

John S. Clancey has succeeded D. J. O'Keefe as boss finisher at the Racine (Wis.) Woolen Mills.

Clifford H. Cowen has resigned his position with the Wickford (R. I.) Worsted Mill to take the assistant superintendency of a woolen mill in Somerville, N. J.

Barney Carney, late of Holyoke, Mass., has accepted the superintendency of the Verd Mont Mills, Ludlow, Vt.

John E. Curran, overseer of the spinning department of E. E. Hilliard Co.'s mill at Buckland, Conn., for fifteen years, has resigned. Walter Weeder, who has had charge of the new mill spinning room for the last year and a half, will be overseer of both rooms. He will have an assistant, William Newberry.

Edward Devine, for several years boss finisher for the Anderson Mills of Skowhegan, Me., has taken a similar position in Philadelphia.

Charles Eddy, for many years overseer of weaving in the Slater Mill, Webster, Mass., has resigned.

Robert Elliott, formerly overseer of finishing for Sutton's Mills, North Andover, Mass., is the new finisher at the Rochester (N. H.) Woolen Co.'s mill.

Arthur W. Etchells, superintendent for many years in English and American woolen and worsted mills, has recently resigned as designer on fancy worsteds with the Rock Mfg. Co., Rockville, Conn.

William Fisher of Rochester is the new superintendent of C. H. Klemer & Sons' woolen mill at Faribault, Minn. Mr. Fisher was originally with the George Merrit Woolen Mill of Indianapolis, Ind.

J. Greaves is now boss carder at the Maple Grove Woolen Mill, Adams, Mass. He was formerly of Philadelphia, Pa. Thomas Murphy, second carder, has resigned to accept a similar position at the Roy Mill, Troy, N. Y., and has the best wishes of his associates at Adams. D. Pero is the boss weaver at the Maple Grove Mill, assisted by his son, D. Pero, Jr., secondhand. Thomas Moran is finisher; William T. Morgan, spinner; Michael Magor, second spinner; Charles Rutherford, dyer. The mills are running steadily with plenty of orders.

Andrew F. Griffin, designer and superintendent of the Ray Mills of the American Woolen Co., Franklin, Mass., has resigned to become superintendent and part owner of a woolen mill at North Oxford.

James Goode, formerly superintendent of the Crown Mills, Marcellus, N. Y., has succeeded Andrew F. Griffin as superintendent of the Ray Mills of the American Woolen Co., Franklin, Mass.

James H. Hendry, late of Amos Abbott & Co., Dexter, Me., has accepted the position of superintendent of two mills for the Canada Woolen Mills, Carleton Place, Ontario, Canada. The mills have been known by the names of the Gillies Woolen Mill and the Hawthorne Woolen Mill. Mr. Hendry has full charge of both mills.

Ex-Mayor E. L. Heath, who has been employed in the office of the Rock Mfg. Co., at Rockville, Conn., for the past thirty-three years, has accepted a position in the office of the American Woolen Company, Boston, taking the position held by C. J. Bodfish, who goes to Maynard, Mass., to act as resident agent for the Assabet Woolen Mill.

Walter S. Irwin of Rockville, Conn., has gone to Plymouth, Mass., where he has accepted a position as designer with the Puritan Woolen Mills.

Robert Julia, overseer in the finishing department of Talcott Brothers Mill, Talcottville, Conn., has resigned. He has been in this mill for 15 years, and now retires from business.

James Jourett, recently employed as overseer of spinning in Thompsonville, Conn., is engaged in a similar capacity in the Moosup Mills of the American Woolen Co., Moosup, Conn.

L. M. Lindsey is finisher at the Waverly Woolen Co., Pittsfield, Me., having succeeded Joseph McKechnie.

Thomas Lyons, who was overseer of the wet and dry finishing for the Rock Mfg. Co., Rockville, Conn., for several years, has accepted a similar position with the Weybosset Mills, Olneyville, R. I.

L. N. McGovern, boss dyer and finisher, late of Oakland, Kas., has accepted a position in Reynoldsville, Pa.

George R. McDougall has accepted the position of overseer of carding with the American Woolen Co., Winooski, Vt.

Joseph A. Naylor, recently employed setting up machinery for the Davis & Furber Machine Co., has accepted a position as an overseer of spinning under the head of overseer of carding and spinning, Theodore St. George of the Hartford Carpet Corporation, Thompsonville, Conn.

T. N. Parent, late of Moosup, Conn., has accepted the position of overseer of carding with the Westerly Woolen Co., Westerly, R. I., in one of their nine set rooms.

Orville Pero, formerly of Plymouth, Mass., is now overseer of weaving at the Success Worsted Mill, North Chelmsford, Mass.

O. M. Prichard has been engaged as overseer of weaving at the Evansville (Ind.) Woolen Mill.

William J. Roebken, who has been superintendent for the Cedarburg Woolen & Worsted Mills for 20 years, has resigned to take charge of the Badger Worsted Mill, Grafton, Wis.

W. H. Shaw of Montreal is at present lining up all the mules in the two mills at Carleton Place,, Ontario, for the Canada Woolen Mills Co.

Hugo Schnitz, formerly finisher for the Wilton Woolen Co., Wilton, N. H., is the new finisher at the Germania Mills, Holyoke, Mass.

William F. Shaw has resigned as superintendent of the American Woolen Mill at Skowhegan, Me.

Charles Tait, formerly of the Montreal Woolen Mills Co., is designer at the Waverly Woolen Co., Pittsfield, Me.

W. D. West, who assumed the superintendency of the Conshohocken (Pa.) Woolen Co. last year, is now manager of the plant.

Mr. Warwick, superintendent of the Canada Woolen Mills, Carleton Place, Ontario, has resigned.

David E. Wilen is now designer for Greaves Bros., Philadelphia, Pa.

Knit.

C. B. Atkins of Millbury, Mass., has gone to Cleveland, O., to accept a position with Bamberger & Neuman, a new concern starting up for the manufacture of knit goods.

H. D. Buck, late of Detroit, Mich., has accepted a position with the Utica Knitting Co., Utica, N. Y.

Irvin L. Beebe of Winsted, Conn., is now foreman of finishing with the Harder Mfg. Co., Valatie, N. Y.

E. H. Everett, late of the Griffin Knitting Mills, Griffin, Ga., is now with the Atlanta Knitting Mills, Atlanta, Ga.

Fred S. Gammack of West Hartford, Conn., has accepted a position in Lynchburg, Va., where he will have charge of the dyeing department of the Virginia Textile Company.

George B. Griffin has succeeded E. H. Steenburgh as paymaster of the Victor Knitting Mills Company, Cohoes, N. Y.

M. H. McEvoy, formerly dyer at the Jefferson Mfg. Co., Jefferson, Mass., is now dyer at the Victor Knitting Mills Co., Cohoes, N. Y.

John Secor, formerly of Cohoes, N. Y., and for several years past employed as overseer of carding by the Winsted Hosiery Company of Winsted, Conn., has been promoted to the superintendency of this mill. George Bebb succeeds Mr. Secor as overseer of carding.

Deaths.

Hon. Addison S. Hopkins of Burrillville, R. I., died recently. He had been in ill health for about a year. Mr. Hopkins began business as bookkeeper for A. Hopkins & Co., and in 1868 became a partner. In 1876 he became general manager, and on the death of his father that year he took charge of the business with J. H. Porter. In 1899 Mr. Hopkins assumed full control, and under his management the machine works were enlarged to more than twice their former size and capacity, and a brass foundry

has been added to the plant. His death is mourned by a large circle of friends.

Christopher Glennon, for many years a prominent citizen of Dalton, Mass., has deceased. He was engaged in the woolen manufacturing business at Dalton until 1893, when he retired to a quiet life. He had held many public offices in the town. Michael Glennon, a son of the deceased, is superintendent of the Oakland Woolen Mill at Baltimore, Md.

Daniel N. Paine died in Foster, R. I., September 3. Early in life he formed the firm of Hathaway, Paine & Co., for building machinery. The same firm afterwards manufactured satinets for a few years, when the deceased became the sole proprietor, and made the same class of goods for many years under contract with Edward Harris. Mr. Paine's last venture in business was the manufacture of stockings.

John W. Money of Carolina, R. I., died recently in his eighty-second year. He was engaged in cotton manufacturing during many years of his active life. He was a former owner of a part of the Carolina Mills, having been at one time a partner of Rowland H. Hazard. Mr. Money sold his interests in the mill about 1861 to Mr. Hazard, and subsequently acted as superintendent of the mill. Later he went to work for A. & W. Sprague, acting as superintendent of the mill at Arctic. He was also superintendent of cotton mills at Bristol and Fitchville, Conn.

Samuel Thornton, formerly a prominent manufacturer of textile goods for nearly fifty years, died at his home in Philadelphia early last month, in his 77th year.

Hugo Funke, who built the Rhenama Silk Mills in College Point, N. Y., for the manufacture of silk ribbons, which at the time were the largest mills of the kind in this country, died at his home in College Point, last month of typhoid fever. He was fifty-six years old and was born in Gladbach, Germany. He started as a cotton broker in Manhattan.

John Schofield, superintendent of the Moultrie Cotton Mills, Moultrie, Ga., died September 9th. He was an Englishman by birth. He came to Moultrie from Toccoa, Ga., about two years ago.

Lorenzo S. Way, son of Daniel Way, founder of the town of Ways Mills, P. Q., and an old-time woolen manufacturer, died at the home of his daughter, in Methuen, last month, aged 85 years. He carried on manufacturing at Ways Mills fifty-five years, succeeding his father. He was a native of Rochester, Vt., but when quite young his parents removed to Canada, and for half a century he resided there.

Don Alonzo Beck, who, with his brother, Theodore S. Beck, was engaged in business in Hoboken, N. J., as a silk manufacturer, died September 20th at his home in East Orange. He was 45 years old.

W. Mason Cooper died at his home, in Orange, N. J., September 20. Born in Brooklyn, in 1864, he early entered the office of Van Volkenburg & Leavitt, and was successively with Ammidon, Lane & Co., Hazelhurst Bros. & Co., Leavitt & Mitchell Bros., Francis H. Holmes of Oelbermann, Dommerich & Co., and in December last accepted a position with Stevens, Sanford & Handy. His death is mourned by many friends and business acquaintances.

John Hand, head of the silk manufacturing firm of John Hand & Sons, Paterson, N. J., died September 26. He was seventy years old, and a native of England, where he learned the silk business. He came to this country in 1882, and started in a small way. As his business grew, he moved from mill to mill until in 1892 he built the large mill which the concern now occupies. He never took part in public affairs, confining himself to business, in which he was assisted by his sons Frederick, Thomas and William, who survive him.

Donald Mackintosh, aged 88 years, of D. Mackintosh & Sons Co., Holyoke, Mass., died late last month. In 1843 he came from England to accept the position of dyer with the Hartford Carpet Corporation, then located at Tariffville, Conn., with which concern he remained eight years. He was engaged in Holyoke as dyer for a number of years, and in 1866 started in business for himself, but his factory was burned. After being at Northampton for a short time, he came back to Holyoke, and the Hampton Mills failing, he bought the property and founded the present firm, which has carried on a successful cotton business.

F. F. Gilleran of the firm of Sayles & Gilleran, Woonsocket, R. I., died recently. The deceased was born in Rhode Island forty-two years ago. Before locating in Woonsocket he was superintendent of W. H. Prendergast's mill in Bridgeton. With Silas W. Harding of Burrillville as a partner, five years ago he embarked in the cotton worsted manufacturing business. Later they dissolved partnership and Henry F. Sayles bought Mr. Harding's interest, and the mill has been operated under the firm name of Sayles & Gilleran. Quite recently W. H. Prendergast purchased Mr. Gilleran's interest. A widow and three children survive him.

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*New York, Binghamton. A large brick factory building on Park Avenue, has been leased by the Binghamton Fabric Printing Company, which will equip same with machinery for stamping fabrics by a special process. This refers to the project mentioned last fall in connection with Bethel Ware, inventor of the process. A meeting has been held by those interested to form plans for securing necessary capital to buy the building and put the plant in active operation.

Rhode Island, Providence. The Globe Dyeing and Bleaching Co. has been incorporated with capital stock of $300,000, by Kendall W. Whittemore, Andrew and John Ewart. They propose dyeing, bleaching, finishing and mercerizing cotton, woolen and other goods.

*South Carolina, Gaffney. Work is progressing on construction of the finishing mill for the Gaffney Manufacturing Co.

*Virginia, Petersburg. Work will soon be started in the dye house for silk goods, established here by Werres & Hinton.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the compositionof yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Allowance for Waste.

Editor Textile World:

What percentage should be allowed for waste between picking room and weave room in batches made with 60 per cent. wool, and 40 per cent. shoddy?

Paradise (256).

The percentage for waste that should be allowed in batches depends altogether upon the quality and condition of the wool and shoddy, and, consequently, a definite amount cannot be given for all cases. Speaking generally, we should say that with such stock as Paradise is using (60 per cent. wool, 40 per cent. shoddy) 25 per cent. would be about right for waste between the picking room and weave room. The usual custom is to observe the first batches of new stock closely, and see how much yarn is obtained from them; if the allowance made is too much or too little, it can be changed as required.

Percentage Scale for Top.

Editor Textile World:

Where can I get a percentage scale for weighing worsted top, which will indicate the percentage of noil combed from the stock? Our comber cannot calculate the percentage of noil.

Automatic (269).

Stoddard, Haserick, Richards & Co., Boston, Mass., are agents for a scale indicating the percentage of noil combed from worsted stock. The following directions for using this scale will give a good idea of its operation:

"To determine the percentage of waste in raw materials proceed in the following way:

"Start the comber, after a time, for instance one minute, stop the machine and take away the combed materials and the waste.

"Hang the combed lea to the big hook of the scale, the waste to the little one. The finger will then indicate, on the lower scale, the quantity of waste (per cent.) contained in the raw material.

"If you want to know what the combing machine produces, that is to say if it works regularly, take the waste from the little hook, and replace it with the counter-weight delivered with the instrument, and which weighs exactly 20 grs. (or 10 drams). The finger then shows the weight of the combed lea in drams, on the upper graduation.

"In the same way, to know the weight of any article, hang it to the big hook and place the counter-weight on the small hook."

These scales are very convenient, but every comber should be able to make these calculations from the weight of noil and top delivered in a given time.

The rules are very simple: To find the percentage of noil, divide the weight of the noil by the weight of both top and noil. To calculate the production per day, multiply the weight of both noil and top by the minutes per day and divide by the minutes required for their delivery.

Ex. A comb delivered 336 ounces of top and 35 ounces of noil in 25 minutes.

35 (noil) ÷ 371 (noil and top) = .094 per cent. of noil.

371 (noil and top) × 615 (minutes in 10¼ hours) = 228,165.

228,165 ÷ 25 (minutes occupied by test) = 9126 ozs. or 570 lbs. top and noil per day of 10¼ hours.

Excessive Moisture.

Editor Textile World:

We are bothered on damp days by excessive moisture, injuriously affecting certain materials which we employ in our manufacturing, and wish to know if there is any method or device for remedying this by absorbing the excessive moisture on a large floor running under normal conditions?

Broad (261).

We are not familiar with any other method of getting rid of excessive moisture in summer except through ventilation. Doubtless a proper ventilating en-

gineer could overcome your difficulty by a suitable system of ventilation. The conditions prevailing in mill dyehouses, finishing rooms and other departments, where there is much steam and moisture, are so remedied. If the conditions in the room were such that the windows could be kept closed, the air supplied to it might be dried before its introduction to the room.

Waste in Hosiery Mills.

Editor Textile World:

What is considered a fair percentage of hosiery waste in good hosiery mills using cotton yarn?

Ivan (262).

Anything under one ounce per dozen is considered good practice, providing a good quality of yarn is used. If the waste is more than that, it is either because of poor yarn or poor management. A correspondent in our August issue showed how in a mill with a production of 1,000 doz. per day a slight difference in raveling will effect a considerable saving in waste account.

Textile Instruction.

Editor Textile World:

Will you kindly inform me if there is a textile school in New York City, and, if not, what would be the best method for a person employed during the day in the city to obtain a thorough and practical knowledge of the construction and manufacture of cotton sheetings and drills, especially of the kind that are exported to China?

Wall St. (263).

There is no textile school in New York City where you can obtain this sort of instruction. The correspondence schools are designed to supply the needs of persons who are employed during the day and are unable to attend the textile schools in Philadelphia, Lowell, New Bedford and elsewhere. Many young men employed in commission houses in the city have taken their courses to advantage, and this is undoubtedly the best method for a person employed during the day to obtain such information. You will find advertisements of these excellent schools on other pages of the magazine.

Book on Weaving.

Editor Textile World:

Can you give me any information in regard to a German work on weaving, Die Deutsche Webschule?

Pawtucket (274).

In this issue of the Textile World appears a review of the eighth edition of Die Deutsche Webschule. This work treats of the mechanical technology of weaving and is a very complete and valuable handbook of weaving. The two volumes are profusely illustrated with two thousand drawings and weave diagrams. The section relating to weaves is especially valuable, owing to the numerous and very complete illustrations, enabling the work to be used by those who do not read the German text. There are chapters upon textile calculations, and the mechanical operations of warping and weaving.

Finishing Mercerized Hosiery.

Editor Textile World:

Can you give me any information regarding the processes employed for finishing mercerized cotton hosiery?

Mercer (273).

A system of finishing mercerized hosiery that gives satisfaction is carried on as follows: The stockings are sent in case lots to the dyehouse, where they are wet out or dampened. They are next hydro-extracted, in order to remove surplus water, and sent to the boarding room. A sorter, generally a boy, sorts them out for sizes. After sorting, they are boarded and dried in a hot air dryer. As soon as the stockings are dry, they are stripped from the boards and placed between press papers and pressed in a hot power press from twenty to thirty minutes.

Cheap stockings are simply wet out, extracted, boarded, dried and sent to packing room without pressing, but for a good quality hose, a good finish is indispensable, and it can only be obtained by pressing in hot plate power press.

Many stockings are lisle finished. This is done either in the dyehouse in oxidizing cages, or in finishing room by singeing.

Stockings that are to stand hot pressing must be dyed with colors fast to this process, otherwise streaky goods will result, and in order to get the best results the dyer and finisher should put their heads together, and if this is done, well dyed and finished stockings will be the result.

Roger Williams.

New Publications.

Commercial Atlas; by A. Scobel; Velhagen & Klasing, Leipzig.

Each one of the forty plates in this work gives, by means of colored maps, information concerning the trade, resources, social conditions, etc., of the different sections of the earth.

Plate 1 shows the distribution of the different languages and the different forms of government; Plates 2 and 3, Commerce, colonies and commercial fleets; Plate 4, Currents of trade, climatic diseases; Plate 5, British, French and German cable lines; Plates 6 and 7, Postal union and minerals; Plates 8 and 9, Vegetable products; Plate 10, Vegetation, ocean currents and chief forms of husbandry; Plates 11, 12 and 13, Wild animals; Plates 14 and 15, Domestic animals; Plate 16, Density of population, occupations of people in Germany; Plate 17, Use of land in Germany; Plate 18, Industries of central Europe; Plate 19, Industrial centres of Europe; Plate 20, Water transportation of central Europe; Plate 21, Railways of Europe; Plates 22 and 23, German foreign trade; Plate 24, European vegetable products; Plate 25, European cattle, fisheries and minerals; Plate 26, Industries of Europe; Plate 27, European railways, telegraph and steamship lines and inland navigable waters; Plate 28, Southern Europe and Mediterranean land and water transportation; Plate 29, Atlantic Ocean transportation; Plate 30, Asia, products and transportation; Plate 31, Africa, products and transportation; Plate 32, North America, products and transportation; Plate 33, United States products and transportation; Plate 34, South America, products and transportation; Plate 35, Oceanica, products and transportation; Plates 36, 37 and 38, The world's seaports; Plates 39 and 40, History of colonization.

This elaborate and valuable work must be seen to be appreciated. It is a cyclopedia in graphic form and will prove invaluable both in the schoolroom and in the office of the merchant and manufacturer. The small amount of reading matter is in German, but as the information is conveyed in graphic form, this does not prevent its use by English readers.

Technology of Weaving; by G. Hermann Oelsner; Anton Seud, Altona, Germany; 2 vols., illustrated; price $7.50.

No language is so rich in textile literature as the German, and valuable additions to the store are constantly being made. The latest is the eighth edition of Oelsner's Technology of Weaving, which has been enlarged and revised to such an extent as to place it in the list of new works.

Before the author takes up the subject of weaving he gives a brief account of the various textile fibres, animal, vegetable and mineral, and the processes employed for converting them into yarn for warping and weaving.

Next follows chapters upon yarn numbering and cloth calculations, subjects that, as our readers know, are of exceeding complexity to the manufacturers of Europe, owing to the use there of so many diverse standards.

Under the head of preparing the yarn for weaving, there is found a very good account of warping and sizing, after which the special subject of the work, weaving, is taken up. This part begins with a description of the German loom. Then follows a treatise upon theoretical weaving, which takes up over three hundred pages of the book. The different weaves are classified, described and illustrated, 1,000 drafts being given. It has been the aim of the author to give examples of each kind of weave, leaving the student to make modifications of which the number is endless. This section is confined to the intersection of warp and filling and is therefore of the same value to weavers regardless of the particular loom employed.

There is an excellent description of jacquard weaving, both practical and theoretical.

The author has given a separate section to the description of fabrics of peculiar construction, velvet and velvéteen, plain and figured, chenille, plush, astrachan, carpeting, leno, etc. The work ends with a chapter on selvages. The text is in German.

The Utilization of Waste; by Prof. Peter T. Austen; Forum Publishing Co., New York.

This is a reprint in pamphlet form of an article in the September, 1901, Forum, and gives a very interesting account of the uses to which waste products from manufacturing are put.

Light and Heat; by Rich. Herm. Blochmann; Strecker & Schroeder, Stuttgart. Price $1.50.

This work belongs to the series of popular hand books of science which we have referred to in the notice of Physics and Acoustics, belonging to the same collection. It is written by the same author and affords that very large number of people included under the term, general reader, an excellent opportunity to obtain instruction in natural science of the present time. The text is in German.

Frederick the Great; by Wilhelm Wiegand; Velhagen und Kasing, Bielefeld and Leipzig; Price, $1.25.

This is one of a series of historical monographs. A short but very interesting account of Frederick's career is embellished with numerous illustrations of scenes from his life and times. Not the least interesting parts of the work are the reproductions of autograph letters. Last of all comes a view of the King's death mask, a grim reminder of the vanity of human greatness. The work, which is in German, can be ordered at this office.

A Voyage to Australia and the Southern Seas; von Albert Dalber; B. C. Teubner, Leipzig.

The voyage which is the subject of this interesting book began in April and ended in August, 1900. During that time the author visited Southern Australia, New Mecklenburg, New Guinea, the Caroline and the Landrone Islands. He describes the country, the people and their institutions and customs with a detail that attests his excellent powers of observation. The interest of the reader, heightened by the numerous and excellent illustrations, is maintained from the first to the last page. The text is in German.

Wireless Telegraphy; by Emile Pierard, Brussels; Price, 75 cents.

This is an interesting account of the methods employed from the earliest times to communicate over long distances without the aid of wires. The oldest device described is that of Enee, who lived in the fourth century, B.C. The progress made since that period is shown by illustrated descriptions of the many ingenious devices employed at different times. The latest development of wireless telegraphy in language as familiar as it can be made when treating of such a technical subject. The text is in French.

Cotton Mills in India; published by The Indian Textile Journal Co., Bombay; price 50 cents.

The reference book of cotton mills in India contains a list of the mills, giving the location, number of hands employed, looms and spindles. To this are added many useful formulas for making calculations for scutchers, cards, drawing, slubbing, intermediate, roving and ring frames, mules, etc.

New Color Cards.

Colors Fast to Milling on Shoddy. Cassella Color Co., 182 Front St., New York City.

This collection of colors is of more than usual interest, owing to the elaborate and most convenient case in which they are placed. It permits of the samples being taken out by the dyer and shaded as in the everyday work in the dyehouse. There are eighty-four compartments filled with samples showing a wide range of colors on shoddy. Full directions for dyeing with formulas are given.

Immedial Colors on Cotton. Cassella Color Co., 182 Front St., New York City.

This color case is divided into eighty-four compartments filled with samples of cotton covering a wide range of shades. The value of this collection to the dyer consists not only in the samples themselves, but that each can be removed from the case when desired.

Fashionable Colors on Ladies' Cloth. Victor Koechl & Co., 122 Hudson St., New York.

This sample card shows a large number of beautiful shades on ladies' wool dress goods. The samples are well arranged to show the combinations of different colors. A sample of this card should be in the hands of every dyer of woolen and worsted goods.

Oxy Diamine Black on Straw and Chips. Cassella Color Co., 182 Front St., New York.

This card shows four samples of straw dyed with Oxy Diamine Black. Full directions and formulas are given.

Benzo Fast Blue G. Farbenfabriken, New York.

This card shows four samples. Two of cotton cloth dyed with Benzo Fast Blue G and two printed with the same color.

Brilliant Rhoduline Purple R. Farbenfabriken, New York.

This card has two samples of cotton yarn and six of cotton cloth dyed or printed with the Brilliant Rhoduline Purple R.

Pluto Black A extra. Farbenfabriken, New York City.

This card has one sample of sateen and one of half-woolen Italian cloth dyed with Pluto Black A extra.

New Publications.

Alumni Association of the Philadelphia Textile School; First Annual Report, 1902.

The first report of this association is an attractive pamphlet of 75 pages. In the introduction is given a brief account of the origin and organization of the association, a copy of the constitution, a list of officers for 1902-3, list of active members and the treasurer's report.

Next come two addresses, the first on "Industrial Education," by Charles H. Hutchins, and the other on "Electricity in the Production of Textiles," by Sidney B. Paine, and the following interesting papers: "Marketing Textiles," Robert T. Francis; "Machinery and Methods in the Manufacture of Narrow Fabrics," John Crowther; "The Value of Textile Education," Samuel Butterworth; "A Chapter on Decorative Design and Industrial Art Education," Wm. Laird Turner; "The Application of Alizarines to Worsted Yarns," William C. Robb; "The Relation of the Textile School to the Textile Industry," Henry M. Wilson, and "The Development of Indigo," Albert Behm.

The officers are: President, Bradley C. Algeo; first vice-president, Harland J. Maynard; second vice-president, Alex. Y. Davison; honorary vice-president, Theodore C. Search; secretary, H. H. Bosworth; treasurer, William Steele; auditor, L. M. Dillon; directors (to serve for three years), Charles Bond, Samuel Butterworth; (to serve for two years), Herbert Armstrong, J. S. McMaster, Jr.; (to serve for one year), William C. Robb, William Stafford.

Much interest has been shown in the organization and the bringing together of students cannot fail to be of great benefit to all.

"That no scale shall form in boilers." Harrison Safety Boiler Works, Philadelphia, Pa.

This is an attractive booklet in which the Sorge-Cochrane system for heating and purifying water for boilers is described and illustrated.

Feed Water Heaters and Purifiers.

This booklet describes the feed water heaters and purifiers manufactured by the Harrison Safety Boiler Works, Philadelphia, Pa.

Egyptian Cotton Chart. Stoddard, Haserick, Richards & Co., Boston, Mass.

We have received a copy of this chart issued by Carver Bros. & Co., and which shows in graphic form the fluctuations of Egyptian cotton during the years 1899-1902. Our readers are already familiar with the value of price charts, as they are a regular feature of the Textile World.

Textile Industry. Circular of the Clemson College, S. C.

This circular has been issued by Clemson College, to make announcement of changes in the textile course consisting of the addition of certain branches and a provision for shorter courses for students who are unable to take the full four years' course.

New Bedford Textile School; Catalogue, 1902-1903.

We have received a catalogue of this well known institution which contains

the usual information in regard to the fall term, courses of instruction, etc. The pamphlet contains many interesting views of the interior of the school, which is equipped with the latest machinery in all of its departments.

Bulletin of the National Association of Wool Manufacturers of Boston, Mass. The September issue has for a frontispiece a portrait of the late William Greenough. The contents are as follows: Industrial Education, The Need for a Permanent Tariff Commission, Prices of Reviews, Obituary Notices, Miscellany, Woolen Goods, 1890-1901, The Industrial Progress of the United States, The Textile Industries of the United States, Book and Report of the Boston Wool Market.

Color Chart.

An ingenious card device, for displaying the colors of Dixon's Silica-Graphite Paint in such manner as will permit of an exact idea of each color, is being issued by the Joseph Dixon Crucible Company, Jersey City, N. J.

The color chart carries with it suggestions as to the class of construction that can be protected with this paint, also instructions as to best methods of applying protective paint.

The new color chart can be secured by request to the Joseph Dixon Crucible Company, Jersey City, N. J.

Cling-Surface.

The following letter has been received by the Cling-Surface Mfg. Co., 146-152 Virginia street, Buffalo, N. Y.:

Philadelphia Textile School,
Philadelphia, April 22, 1902.

Gentlemen:—In reply to yours of recent date, allow me to say it gives me great pleasure to add a word of testimony in behalf of the Cling-Surface, which we received from you the early part of last fall.

We have some very peculiar drives here in the school, made necessary by the great variety of machinery in use, and we find by the aid of Cling-Surface properly applied the slippage of belts has been brought down to a minimum, and can be run with less tension than they could before we used the preparation. We have also applied Cling-Surface to our mule banding, and every indication points to the life of the band being extended very materially. The grip is better, the surface is smoother, and I think I am justified in saying that the bands show less variation in damp weather than they did prior to the use of the preparation. On the whole, I consider Cling-Surface a very valuable aid to efficiency where belts or rope drives are necessary in the transmission of power, and feel free to recommend the same to any who are in the market for a belt preparation. Yours very truly,

E. W. FRANCE,
Philadelphia Textile School.

Soft Water is Always Available.

The Buffalo & Susquehanna Iron Co., of Buffalo, N. Y., have contracted with Wm. B. Scaife & Sons Co., of Pittsburg, Pa., for a 6,000 h. p., We-Fu-Go water softening and purifying system. This is the third plant purchased by these people of the same kind, located at other points.

Wm. B. Scaife & Sons Co. are receiving large contracts for both the Scaife and We-Fu-Go water systems, of which they are the sole manufacturers.

They have now in successful operation over 200,000 h. p. in the United States alone, handling over 25,000,000 gallons of water daily, principally for boiler use, although a part of this amount is used in almost every industry where soft water is desirable.

Among some of their other recent sales are the following: Pennsylvania Salt Mfg. Co., Wyandotte, Mich., 1,750 h. p.; Hecla Portland Cement & Coal Co., N. Bay City, Mich., 1,500 h. p.; Hecla Portland Cement & Coal Co., West Branch, Mich., 500 h. p.; The Toledo Furnace Co., Toledo, O., 3,750 h. p.; The National Mining Co., Sygan, Pa., 1,000 h. p.; Pittsburg Plate Glass Co., Elwood, Ind., 2,500 h. p.; Lancaster Mills, Clinton, Mass., 1,000,000 gals.

Textiles at the Mechanics' Fair.

At the Mechanics' Fair at Boston are several textile exhibits. By far the most interesting of these is the bobbin-lace work by an Italian girl, Thesa Pellegrini. It is a wonderful exhibition of manual dexterity. She has fully one hundred small bobbins wound with silk, each being about three inches long and one-half an inch in diameter. Filling each hand with these bobbins the girl rolls and fumbles them apparently with no regard for order, but if the spectator waits long enough the beautiful silk lace will be seen slowly spreading over the pillow to which the silk threads are fastened.

In addition to this, the Swedish hand-weaving exhibits deserve notice. A plain fabric is woven on a hand loom and the operator passes extra filling threads through the shed by hand as the work proceeds, producing beautiful patterns on the plain ground.

A. Chester & Co., silk manufacturers of Paterson, N. J., have a ribbon loom in operation. There is also an exhibit of Colonial rug weaving on a hand loom, and a full-fashioned knitting machine in operation, built by the Empire Machine Works, New Brunswick, N. J.

Union Button Sewing Machine Company.

The Royal Gem Knitting Mills, Jos. Reaney general manager, have recently placed an order with the Union Button Sewing Machine Company for fifteen of the latest style button sewing machines, fitted with the thread-trimming device. John Hayes, Philmont, N. Y., also recently installed one of the latest style button sewers and a drawer strapper. The "Union" company is meeting with well-deserved success in introducing the thread-trimming device on their button sewing machines.

—The United Steel Co., Canton, O., have placed order for four 250 water tube boilers with the Pittsburgh Gage & Supply Co., Pittsburgh. Other recent contracts include power transmitting machinery outfit for the Maryland Paper Co., and a rope transmission for the State Institution for Feeble Minded, Polk, Pa.

Colorado Agency.

Mr. James W. Copeland, of No. 934 Equitable Building, Denver, Col., has been appointed sole agent for the state of Colorado, for the Scaife and We-Fu-Go water softening and purifying systems, manufactured only by Wm. B. Scaife & Sons Co., Pittsburgh, Pa.

Mr. Copeland was formerly located at St. Paul, where for a number of years he was one of the most successful manufacturer's agents of that city. He has recently opened an office in Denver to further the various interests which he represents, and is well known throughout the west in mechanical and engineering circles.

Mr. Copeland has always given the subject of water purification considerable attention, and is particularly well versed in this line. He is, therefore, well fitted to take charge of this new department, to which he will give his special attention.

Ice Rakes.

This is the time of year when it is well to prepare for the colder weather coming. Every mill using water power needs an ice rake. Some may not be aware that there are special rakes just for this purpose, which are carried in stock by Homer F. Livermore, 85 Pearl St., Boston, Mass., Dept T. They are made of the best malleable iron, and are in use by many textile mills.

The Southern Railway Exhibition.

The management of the Southern Railway is always alive to the situation. The work it is doing, looking for the development of the country its line serves, is manifested on every hand.

The exhibit made by the Southern Railway at the fall festival which is held in the exposition building in Cincinnati, and continues for two weeks beginning September 15th, is attracting the attention of thousands of people. The exhibit occupies two thousand square feet of floor space and is made up of samples and specimens of various woods and minerals, grasses, grain, fruits and vegetables raised in the States of Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Kentucky and Tennessee. The display of fresh fruits, especially apples, from the south is a wonder to the northern people, and visitors to the exhibit generally express surprise that such magnificent apples are grown in the south. Not less than twenty-five varieties from western North Carolina alone are on display.

As the result of this exhibit the attention of thousands of people is directed to the southern country, and it is not uncommon to hear said: "This exhibit convinces me that the south must be a wonderful country. I expect some day to investigate it with the view of locating." The representatives of the land and industrial department of the Southern Railway Company are in attendance for the purpose of giving specific and reliable information to visitors concerning lands, mines, factory sites, etc. The Southern Railway Co., through its land and industrial department, is making several such exhibits in the north.

Bobbins, Spools, Etc.

The Wisconsin Mfg. Co. of Two Rivers, Wisconsin, manufacturers of hosiery boards, glove and mitten forms, whose advertisement appears on another page, have arranged to manufacture wood bobbins, spindles, spools and a complete line of turned wood goods of every description. They solicit the patronage of the trade.

Increasing Facilities.

Messrs. Bosson & Lane, manufacturers, importers and dealers in dyestuffs, chemicals, colors, etc., whose Boston office is at 36 Central Wharf, purchased in July a factory property in Atlantic, a suburb of Boston, conveniently located for railroad facilities, and have during the summertime erected an additional building and equipped the plant with every convenience for their business. Their facilities will be far superior to what they formerly were, and their capacity will be greatly increased by this new factory.

Staudt & Co.

The following announcement has been sent to the trade:—

Sept. 15, 1902.

Dear Sir:—

We beg to inform you that we have transformed today our representation for the U. S. A. into a branch firm with office at Boston, Mass., 620 Atlantic Ave. We are devoting ourselves especially to the purchase and importation of wool from South America. Mr. J. Emhardt will be in charge of our Boston house.

Yours respectfully,

Staudt & Co.

Cassava Starch.

For the past three years, much interest had been shown by the textile manufacturers in the starch especially prepared for their use by the Planters Mfg. Co., of Lake Mary, Fla., and extensively introduced by Messrs. Henry A. Elwell & Co., of Philadelphia, Pa.

This starch is made from a root grown in Florida, similar to potato, and is entirely free from impurities found in other starches. Hence the strength is great and the finish of yarn or cloth does not change under atmospheric conditions or age. Test goods finished two years ago have been examined, where the finish is exactly the same as when finished, no dusting off, or change of color or feel, although goods have been subject to heat and moist atmosphere.

It is stated that this starch has a natural gum, making it very adhesive, with great elasticity and penetration, and that it strengthens the yarn.

It is used alone or mixed with other starches and fillings to replace corn, potato and wheat starches on yarns and warps, and in finishing all kinds of fabrics, giving a very clear, brilliant finish and bright color, at a less cost than other starches. It has also been used on finishing lawns, instead of dextrine and gums.

Softening and Purifying Water.

Mr. J. Howard Ewald, 83 Laclede Building, St. Louis, Mo., has been appointed sole agent for Southern Illinois, Missouri and Texas, for the Scaife and We-Fu-Go water softening and purifying systems. These systems are manufactured only by Wm. B. Scaife & Sons Co., Pittsburgh, Pa.

Mr. Ewald has been for years identified with the iron and steel industries in this section and is well known in manufacturing and engineering circles. He has made a special study of the subject of water purification and is abundantly able to take care of this line of work, being expert on the subject of water and its purification. The Pittsburgh Plate Glass Company have contracted for a 2,500 h. p. We-Fu-Go water softening and purifying system, to be erected at their Elwood, Ind., plant.

This system is to soften and purify well water which contains exceptionally large quantities of scale forming and corroding substances, for use in their boiler plant. All sorts of devices and apparatus have been tried for this purpose, without obtaining the desired results. After careful investigation, the We-Fu-Go System has been selected.

Among some of the recent contracts closed by Wm. B. Scaife & Sons' Company for both the Scaife and We-Fu-Go water softening and purifying systems, are the following:

Union Steel Company, Donora, Pa., 500,000 gallons; Pennsylvania Salt Manfg. Co., Wyandotte, Mich., 150,000 gallons; The Ogemaw Co., North Bay City, Mich., 1,500 H. P. Plant; The Ogemaw Co., West Branch, Mich., 500 H. P. Plant; The Lancaster Manfg. Co., Clinton, Mass., 1,000,000 gallons; The Gibson Manfg. Co., Concord, N. C., 100,000 gallons.

A Unique Garden Spot.

After the turmoil of the long summer one instinctively casts about for a winter's abode. A place remote from the whirl of the city where quietness reigns and where the advantages of the metropolis may be had is invariably chosen. The busy man of course wishes to be within hailing distance of New York and just far enough away that the train ride is not tedious. That fashionable winter resort, Lakewood, N. J., meets every demand. A ninety-minute journey lands you in Lakewood, where your most particular whims are catered to and the conveniences afforded are palatial in every respect. The public schools are model educational institutions, and there are also several private schools of reputation. The climate at Lakewood is at least 10 degrees warmer than New York or Philadelphia. The roads for those who enjoy driving or the auto are exceptional. The pine belt in which this charming resort is located is healthful in the extreme, and for social environs Lakewood has no equal.

The hotels are marvelously kept hostelries and every contrivance is at hand for the convenience and comfort of the guests. Outdoor life is the thing at Lakewood, and golf, polo, cross country riding and coaching are of course the favorite recreations. If you want to know more of Lakewood, send a postal to C. M. Burt, General Passenger Agent of the New Jersey Central, New York Department 314, for booklet and time table.

A New Mercerizing and Yarn Converting Establishment.

The Scranton Yarn Finishing Co., Scranton, Pa., a new concern, which has recently been launched under favorable auspices, was incorporated with a capital stock of $50,000, and a fine piece of property has been fitted up especially for the business. The dyehouse is entirely new and equipped with all the latest improvements, with a separate laboratory attached. Their business is the bleaching, mercerizing and dyeing of cotton yarns. They have at present three machines installed for mercerizing, which give them a capacity of 1,000 lbs. per day. The machines are the invention of Mr. William Menzies, late of the firm of Morgan & Menzies, which have peculiar advantages of their own which give a fine lustre to the yarn. Mr. Menzies is a large stockholder and the general manager of the establishment. They put up yarn in various ways required by the trade, and make a specialty of coning. The plant is now in full operation, and they already are in receipt of some large orders.

Prize Competition.

The Industrial Society of Rouen, France, have offered prizes in the form of medals of various grades for articles on the following subjects:—

Steaming colors printed on cotton cloth.

Mordants for fixing colors on cotton, either printed or dyed.

Thickeners in printing.

New sources of albumen; Sky blue of moderate cost, fast to acids, alkalies, chlorine, air and light, and as bright as ultramarine blue.

The composition of compounds used in dyeing and printing.

Use of commercial glycerine.

Determining the comparative value of commercial indigo.

Fixing fast artificial colors at a moderate cost.

A substitute for Senegal gum as a thickener.

A finished compound not altered by heat, and as economical as the farinaceous substances.

A red or blue dye as fast as alizarine or indigo, and which can be applied to cotton without a mordant.

A substitute for logwood, which is superior to the latter in fastness without being as expensive.

A yellow dye product of a clear, bright shade as fast as alizarine, and which can be applied in the same manner as the latter.

A dye which will color cotton a good shade of grey with aluminum, iron or chrome mordants.

A single product color that will resist a boiling soap solution containing 30 grams soap per quart, having for the same depth of color a greater degree of fastness to light than alizarine grey, which turns yellow quickly under certain atmospheric conditions.

A bright, clear green made with one dye, which can be applied to cotton in combination with alizarine colors, and which is as fast as the last named.

Synthesis of the natural color products now in use.

The discovery and introduction of a useful product in the manufacture of printed calico or chemical products.

A process of coloring cotton slubbing with alizarine red, producing as good results as are obtained in yarn dyeing and causing no inconvenience in spinning.

A method by which the selvage of piece dyed goods remains uncolored.

A method of stripping coloring matter from the fibre, which will give a white as good as that obtained with zinc powder, but unaccompanied by the inconvenience of the latter and not turning yellow in time, as is the case with the tin process.

A Reminder of the Past.

The textile industry of this country was developed in great measure by the English and Scotch, who, say fifty years ago, were flocking in large numbers to our shores. Their capital consisted of good health, a sturdy character and a knowledge of manufacturing.

They left home and friends to seek their fortune in a new world. It required no small stock of courage to do that.

These pioneers and their friends they left behind have been bound together during more than half a century by those chords of memory which have endured in spite of separation and the lapse of time.

A pleasing example of this is seen in the letters which follow, written soon after the portrait and first part of Sam Driver's memoirs appeared in this magazine:

Rochdale, August 27, 1901.

Samuel Driver, Esq., Boston, U. S. A.

Dear Sir:—Seeing an article in the Textile World by you, and reading the remarks, I have come to the conclusion that I knew you before you left Rochdale. The remarks all point to a Sam Driver that lived in Flockey Row, Manchester Road, next door to John Smethurst, and who worked at Oakenrod Mills along with his father, who was called Sam, and his mother's name was Betty. He also had a brother named Jabez, who kept the Castle Inn at Perifold.

If you are the same Sam Driver, I should be glad to hear from you. My name is John Hanson, and I worked at Sparth Bottom, and lived in Flockey Row, a few doors above you. Excuse my troubling you, but your mother and mine were old friends, and I thought I should like to know if you are the author of this article. Can you send me the remaining articles? The Stotts you speak of were relatives of my pal, Charles Stott, whose father kept a shop in Manchester Road.

Yours very truly,
John Hanson.

Rochdale, October 8, 1901.

Dear Sam:—I am very pleased to find that the gentleman whose likeness and whose article I saw in the magazine is one of my playfellows in the days of long ago. It brings old times and pleasant recollections back to me. It also causes us to think that we are a long way on our journey through this world. I am also pleased to find that you are in a good position in life, and tho you have had much knocking about, no doubt you will have got, as we say, used to it, and I hope you enjoy fairly good health with it.

One of our old playmates is to be mayor of Blackpool next year. I wrote last week to congratulate him. No doubt you will remember him after I have told you who he is, tho I have not seen him for thirty years myself. It is James Howarth (we used to call him Jimmy Howarth), and he had an older brother, Sam. They lived at a house just opposite the one you lived in. It stood at the top of the sand hole. I have no doubt you will remember him. He has done very well.

Everybody here was exceedingly sorry to hear of the terrible death of your President, Mr. McKinley. We had flags flying at half mast and a special service in churches and chapels, with the dead march played; in fact, all Englishmen felt that they had lost a friend of our country.

Well, now, I am the chairman of a small company who have just taken out a patent in the United States of America for a loom to weave solid borders to almost any fabric, and we wish to dispose of it. Are you in position that you could be of any assistance to us? The patent could be applied to tablecloths, aprons, carpets and for dhooties, which are largely sold in the East. I enclose you a few samples of the work, and could send you an article or two that have been in the textile papers here. You might let me know what you think of the matter.

Buckley Mills is owned by the Schofields, of Heybrook. I daresay, you will remember the firm. We have 24 sets of engines and spinning and looms to follow. I am one of the partners, and there are other two, that is three of us together, and we are doing very well, I am thankful to say. There are not many of our old playmates now left, in fact I cannot just think of anyone except Jimmy Howarth, just mentioned. And now accept my very best wishes from

Yours very truly,
John Hanson.

—For the mammoth new bread and cracker bakery which the Ward-Mackey Co. are now erecting at 31st and Liberty Sts., Pittsburgh, the Pittsburgh Gage & Supply Co., Pittsburgh, Pa., will furnish two 250 H. P. water tube boilers. This company is also installing a complete White Star filtering system in the power house of the New York & Stamford Street Railway Co., Port Chester, N. Y.

—The Clear Water Bleachery & Mfg. Co., of Augusta, Ga., recently purchased a back-filling mangle made by The Arlington Machine Works, Arlington Heights, Mass. This company manufactures the better class of bleaching and finishing machinery. Every machine they build is erected in their works, thus avoiding the annoyance caused by parts not fitting together so common with cheaply built machines.

Virginia, Farmville. It is reported that an assignment has been made by the Lynchburg Hosiery Co., which leased the plant of the Farmville Hosiery Co., and the mill has been closed. It is thought that the company which owns the property will put same in operation at an early date, as the mills have been running day and night.

IN AND OUT OF THE MILL.

Eli Whitney, Inventor of the Cotton Gin.

With cotton fabrics in kaleidoscopic variety, beautiful and yet inexpensive, it is hard to realize that scarcely more than a hundred years ago there was little prospect of this material ever becoming a common commodity. Cotton growing in the South has been an expensive undertaking, which had brought little profit to the planters, owing to the tedious process of stripping the bolls of seeds. An able bodied negro could strip only a pound in a day, and no one had been able to devise any means by which to hasten the work.

It remained for a clever Yankee to invent the simple contrivance which brought wealth to southern planters.

Eli Whitney was born on a farm at Westboro, Mass., in 1765. His early life was as colorless as that of other farmers' sons of that time. There was not even a county fair nor a Wild West show to vary the monotony of life in his little town. Instead, however, of becoming dulled, his active brain busied itself with the means at hand—his father's carpenter tools. Connected with the farm buildings was a small work shop where his father reseated chairs and did odd bits of carpentry. Here Eli spent more of his time than at his appointed tasks about the farm, so that his father used to say that "Eli would never get on in the world."

When Eli was fifteen years of age he began making nails; they were not handsome and smooth, but were strong and tough, and as the Revolutionary War was then in progress he could sell all he could produce. When the war closed, and the demand for nails was less, Eli threw down his hammer and said: "Now I am going to college." He had very little money, and he worked his way through Yale College, partly by doing odd jobs with his carpenter tools, and later during his college life by teaching.

At the close of his college course he journeyed to Georgia with the expectation of securing a position as tutor in a gentleman's family. On his way to Savannah he became acquainted with the widow of General Greene of Rhode Island. As Whitney did not secure the expected position as tutor, he was glad to accept her invitation to visit at her home, and an opportunity this afforded him to study law.

During this visit Whitney met a number of Southern planters, who were dining at the house. He was interested to hear about the raising of cotton, and in speaking about this industry they said that a man who could invent a machine for stripping off the seeds would make his fortune. At this time it was done entirely by hand. After ten day's labor in the fields gathering the cotton, the negroes, men, women and children, were set at the tedious task of picking off the seeds which clung tightly to the cotton.

After the planters had talked for some time on this subject, Mrs. Greene brought forward an embroidery frame which Whitney had made for her, saying,

"If you want a machine to do it, you should apply to my young friend Mr. Whitney; he can make anything."

"But," protested Whitney, "I have never seen a cotton plant or a cotton seed in my life."

It was not the season to see cotton growing; it had long before been picked and stripped, and no one was at hand to show him. Whitney was thoroughly interested in the matter, however, and after the planters had departed he went to Savannah. Here he hunted about till, in a warehouse he found a few cotton bolls with the seeds still clinging to them. Whitney reasoned that if he should fasten some upright pieces of wire in a board, having the wires set close together like the teeth of a comb, and then pull the cotton through with his fingers the seeds would be torn off and left behind.

This arrangement proving successful, he made a wheel covered with short steel teeth shaped like hooks. These pulled the cotton through more perfectly than his fingers had done, and very much faster. So simple was his first device for taking out the seeds that it seems incredible that something of the sort had not been arranged before.

Thus in the year 1793, Eli Whitney, a Yankee from Connecticut, invented the machine the Southern planters had been seeking in vain. Cotton that had required a day's work to clean a pound, was better prepared for market by his machine at the rate of three cwt. a day. His saw-gin, afterward produced, seized the cotton by rows of teeth like those on a circular saw. These passed between grate bars set so closely that the seeds could not pass through; but the cotton was drawn in and afterward swept off by a cylindrical brush.

The importance of this invention is well described in the charge of Judge Johnson in a suit brought by Whitney at Savannah in 1807, to sustain the validity of his patent:

"With regard to the utility of this discovery . . . the whole interior of the Southern states was languishing, and its inhabitants emigrating for want of some object to engage their attention and employ their industry, when the invention of this machine opened avenues to them which at once set the whole country in active motion. From childhood to age it has presented to us a lucrative employment Individuals who were depressed with poverty and sunk in idleness have risen to wealth and respectability. Our debts have been paid off, our capitals have increased and our lands have trebled themselves in value. Indeed, we cannot express the weight of the obligation which the country owes to this invention."

Today no necessity of life is cheaper than cotton cloth; but before W invented his cotton-gin it sold for

Synthesis of the natural color products now in use.

The discovery and introduction of a useful product in the manufacture of printed calico or chemical products.

A process of coloring cotton slubbing with alizarine red, producing as good results as are obtained in yarn dyeing and causing no inconvenience in spinning.

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The textile industry of this country was developed in great measure by the English and Scotch, who, say fifty years ago, were flocking in large numbers to our shores. Their capital consisted of good health, a sturdy character and a knowledge of manufacturing.

They left home and friends to seek their fortune in a new world. It required no small stock of courage to do that.

These pioneers and their friends they left behind have been bound together during more than half a century by those chords of memory which have endured in spite of separation and the lapse of time.

A pleasing example of this is seen in the letters which follow, written soon after the portrait and first part of Sam Driver's memoirs appeared in this magazine:

Rochdale, August 27, 1901.

Samuel Driver, Esq., Boston, U. S. A.

Dear Sir:—Seeing an article in the Textile World by you, and reading the remarks, I have come to the conclusion that I knew you before you left Rochdale. The remarks all point to a Sam Driver that lived in Flockey Row, Manchester Road, next door to John Smethurst, and who worked at Oakenrod Mills along with his father, who was called Sam, and his mother's name was Betty. He also had a brother named Jabez, who kept the Castle Inn at Perifold.

If you are the same Sam Driver, I should be glad to hear from you. My name is John Hanson, and I worked at Sparth Bottom, and lived in Flockey Row, a few doors above you. Excuse my troubling you, but your mother and mine were old friends, and I thought I should like to know if you are the author of this article. Can you send me the remaining articles? The Stotts you speak of were relatives of my pal, Charles Stott, whose father kept a shop in Manchester Road.

Yours very truly,
John Hanson.

Rochdale, October 8, 1901.

Dear Sam:—I am very pleased to find that the gentleman whose likeness and whose article I saw in the magazine is one of my playfellows in the days of long ago. It brings old times and pleasant recollections back to me. It also causes us to think that we are a long way on our journey through this world. I am also pleased to find that you are in a good position in life, and tho you have had much knocking about, no doubt you will have got, as we say, used to it, and I hope you enjoy fairly good health with it.

One of our old playmates is to be mayor of Blackpool next year. I wrote last week to congratulate him. No doubt you will remember him after I have told you who he is, tho I have not seen him for thirty years myself. It is James Howarth (we used to call him Jimmy Howarth), and he had an older brother, Sam. They lived at a house just opposite the one you lived in. It stood at the top of the sand hole. I have no doubt you will remember him. He has done very well.

Everybody here was exceedingly sorry to hear of the terrible death of your President, Mr. McKinley. We had flags flying at half mast and a special service in churches and chapels, with the dead march played; in fact, all Englishmen felt that they had lost a friend of our country.

Well, now, I am the chairman of a small company who have just taken out a patent in the United States of America for a loom to weave solid borders to almost any fabric, and we wish to dispose of it. Are you in position that you could be of any assistance to us? The patent could be applied to tablecloths, aprons, carpets and for dhooties, which are largely sold in the East. I enclose you a few samples of the work, and could send you an article or two that have been in the textile papers here. You might let me know what you think of the matter.

Buckley Mills is owned by the Schofields, of Heybrook. I daresay, you will remember the firm. We have 24 sets of engines and spinning and looms to follow. I am one of the partners, and there are other two, that is three of us together, and we are doing very well, I am thankful to say. There are not many of our old playmates now left, in fact I cannot just think of anyone except Jimmy Howarth, just mentioned. And now accept my very best wishes from

Yours very truly,
John Hanson.

—For the mammoth new bread and cracker bakery which the Ward-Mackey Co. are now erecting at 31st and Liberty Sts., Pittsburgh, the Pittsburgh Gage & Supply Co., Pittsburgh, Pa., will furnish two 250 H. P. water tube boilers. This company is also installing a complete White Star filtering system in the power house of the New York & Stamford Street Railway Co., Port Chester, N. Y.

—The Clear Water Bleachery & Mfg. Co., of Augusta, Ga., recently purchased a back-filling mangle made by The Arlington Machine Works, Arlington Heights, Mass. This company manufactures the better class of bleaching and finishing machinery. Every machine they build is erected in their works, thus avoiding the annoyance caused by parts not fitting together so common with cheaply built machines.

Virginia, Farmville. It is reported that an assignment has been made by the Lynchburg Hosiery Co., which leased the plant of the Farmville Hosiery Co., and the mill has been closed. It is thought that the company which owns the property will put same in operation at an early date, as the mills have been running day and night.

IN AND OUT OF THE MILL.

Eli Whitney, Inventor of the Cotton Gin.

With cotton fabrics in kaleidoscopic variety, beautiful and yet inexpensive, it is hard to realize that scarcely more than a hundred years ago there was little prospect of this material ever becoming a common commodity. Cotton growing in the South has been an expensive undertaking, which had brought little profit to the planters, owing to the tedious process of stripping the bolls of seeds. An able bodied negro could strip only a pound in a day, and no one had been able to devise any means by which to hasten the work.

It remained for a clever Yankee to invent the simple contrivance which brought wealth to southern planters.

Eli Whitney was born on a farm at Westboro, Mass., in 1765. His early life was as colorless as that of other farmers' sons of that time. There was not even a county fair nor a Wild West show to vary the monotony of life in his little town. Instead, however, of becoming dulled, his active brain busied itself with the means at hand—his father's carpenter tools. Connected with the farm buildings was a small work shop where his father reseated chairs and did odd bits of carpentry. Here Eli spent more of his time than at his appointed tasks about the farm, so that his father used to say that "Eli would never get on in the world."

When Eli was fifteen years of age he began making nails; they were not handsome and smooth, but were strong and tough, and as the Revolutionary War was then in progress he could sell all he could produce. When the war closed, and the demand for nails was less, Eli threw down his hammer and said: "Now I am going to college." He had very little money, and he worked his way through Yale College, partly by doing odd jobs with his carpenter tools, and later during his college life by teaching.

At the close of his college course he journeyed to Georgia with the expectation of securing a position as tutor in a gentleman's family. On his way to Savannah he became acquainted with the widow of General Greene of Rhode Island. As Whitney did not secure the expected position as tutor, he was glad to accept her invitation to visit at her home, and an opportunity this afforded him to study law.

During this visit Whitney met a number of Southern planters, who were dining at the house. He was interested to hear about the raising of cotton, and in speaking about this industry they said that a man who could invent a machine for stripping off the seeds would make his fortune. At this time it was done entirely by hand. After ten day's labor in the fields gathering the cotton, the negroes, men, women and children, were set at the tedious task of picking off the seeds which clung tightly to the cotton.

After the planters had talked for some time on this subject, Mrs. Greene brought forward an embroidery frame which Whitney had made for her, saying,

"If you want a machine to do it, you should apply to my young friend Mr. Whitney; he can make anything."

"But," protested Whitney, "I have never seen a cotton plant or a cotton seed in my life."

It was not the season to see cotton growing; it had long before been picked and stripped, and no one was at hand to show him. Whitney was thoroughly interested in the matter, however, and after the planters had departed he went to Savannah. Here he hunted about till, in a warehouse he found a few cotton bolls with the seeds still clinging to them. Whitney reasoned that if he should fasten some upright pieces of wire in a board, having the wires set close together like the teeth of a comb, and then pull the cotton through with his fingers the seeds would be torn off and left behind.

This arrangement proving successful, he made a wheel covered with short steel teeth shaped like hooks. These pulled the cotton through more perfectly than his fingers had done, and very much faster. So simple was his first device for taking out the seeds that it seems incredible that something of the sort had not been arranged before.

Thus in the year 1793, Eli Whitney, a Yankee from Connecticut, invented the machine the Southern planters had been seeking in vain. Cotton that had required a day's work to clean a pound, was better prepared for market by his machine at the rate of three cwt. a day. His saw-gin, afterward produced, seized the cotton by rows of teeth like those on a circular saw. These passed between grate bars set so closely that the seeds could not pass through; but the cotton was drawn in and afterward swept off by a cylindrical brush.

The importance of this invention is well described in the charge of Judge Johnson in a suit brought by Whitney at Savannah in 1807, to sustain the validity of his patent:

"With regard to the utility of this discovery . . . the whole interior of the Southern states was languishing, and its inhabitants emigrating for want of some object to engage their attention and employ their industry, when the invention of this machine opened avenues to them which at once set the whole country in active motion. From childhood to age it has presented to us a lucrative employment. Individuals who were depressed with poverty and sunk in idleness have risen to wealth and respectability. Our debts have been paid off, our capitals have increased and our lands have trebled themselves in value. Indeed, we cannot express the weight of the obligation which the country owes to this invention."

Today no necessity of life is cheaper than cotton cloth; but before Whitney invented his cotton-gin it sold for a dol-

lar and a half a yard, for planters raised very little cotton. For example: In 1748 among the exports of Charleston, S. C., were seven bags of cotton; in 1784 eight bags shipped to England were seized on the ground that so much cotton could not be produced in the United States. It was little dreamed that in less than a hundred years the same country would produce annually from 10 to 11 million bales.

Whitney returned to the North, and later built a gun factory near New Haven, Conn., at a place now called Whitneyville. Here were manufactured thousands of the muskets used in our second war with England in 1812.

Whitney lived to see the factory built which is still standing at Waltham, Mass., the first in the world that combined all the processes necessary for converting the raw cotton into finished cloth. Three years after the erection of this mill the first cotton mill was erected in the "city of spindles."

Although Whitney realized some financial returns from his cotton gin, they were pitiful in comparison with the wealth that his invention created and the comforts it brought to the human race. His income was derived chiefly from the manufacture of guns and his ideas are embodied in some of the machinery now in use in the national arsenals. He died in New Haven, Conn., Jan 8, 1825. Sir Robert Fulton said of Arkwright, Watts and Whitney, that they were the three men who did more for mankind than any of their contemporaries.

Opportunity.

The key of yesterday
I threw away.
And now, too late,
Before tomorrow's close-locked gate
Helpless I stand—in vain to pray!
In vain to sorrow!
Only the key of yesterday
Unlocks tomorrow!

"Lots of men would leave their footprints
Time's eternal sand to grace,
Had they gotten mother's slipper
At the proper time and place."
—Anon.

Cause and Effect.

Uncle Thomas—I like ter git up early. Then I can git my work done 'fore night an' be able ter go ter bed early.

Johnny—W'ot yer want ter go ter bed early for?

Uncle Thomas—Why, so's I can git up early. You know mighty little 'bout the true philosophy of life.

—Mrs. Wriggles—Lan' sakes! What ye fixin' up so fer?

Mrs. Backwoods—W'y, hain't ye heerd thet Hettie married one o' them French fellers with a ferrin title an' 's coming home next week?

Mrs. Wriggles—Do tell! Did she marry one o' them counts?

Mrs. Backwoods—Mercy me! I guess he's bigger 'n a count. She says in her letters thet he's a chauffeur.—Judge.

Sure to be Prejudiced.

Friend—Don't look so blue. You have a good case.

Jimson—No use. I'll lose. I know I'll lose. Every man on that jury either rented or bought a house of me when I was in the real estate business.—New York Weekly.

The Woman of it.

Maude—Charlie Wiggins sent me a handsome mirror for a birthday present.

Clara—That accounts for the funny question he asked me the other evening.

Maude—What did he ask you?

Clara—If a woman ever got too old to be pleased with a looking-glass.—Chicago News.

A Biased Critic.

The man who shouts that times are hard,
You will observe full oft
Is looking for a berth in life
Particularly soft.
—Washington Star.

A Hint.

She wore a locket round her neck,
A locket of shining gold;
The shape of a heart, and large enough
A picture petite to hold.
I opened the locket to ascertain
Who was her particular pet;
But instead of a miniature photograph
Was a sign which read, "To Let."
—Spare Moments.

The Small Brother.

"I heard him call you 'Duckie,'" announced the small brother.

"Well, what of it?" demanded his sister, defiantly.

"O, nothin' much," answered the small brother. "I was only thinkin' maybe it's because of the way you walk, but it ain't very nice of him."—Chicago Post.

In Life's Journey.

Many men achieve success by an ability to conceal their lack of ability.

The race for wealth and fame often ends in poverty and disgrace.

Come moments when a man is capable of any act of cruelty or of generosity.

We find many occasions to wish we had chosen a different course.

Many lessons are suggested through childish prattle which are worth learning.

It is not always the great men who are thought of the most kindly.

High hopes are often shattered through too much attention to personal comfort.

We see indifferent men march to fame through some other man's mistake.

Too much attention is given to the signs of the times.

Discoveries are made which shake faith in men as well as women.—Philadelphia Bulletin.

Not Ready to Return.

"Ah," he sighed, "I was happier when I was poor."

"Well," they answered coldly, "it is always possible for a man to become poor again."

But somehow the idea did not seem to impress him favorably.—From the Chicago Post.

Spaced Out Too Much.

A judge, in remanding a criminal, called him a scoundrel. The prisoner replied: "Sir, I am not as big a scoundrel as your honor"—here the culprit stopped, but finally added—"takes me to be." "Put your words closer together," said the judge.—Brown Book.

Then and Now.

In
days
long
ago (in
the six-
ties you
know) when
grandma
went walking
she held
her skirts so.

What
would she
say if she
saw girls
today with
skirts
clutched
so tight-
ly they
all
look
this
way?

—Inland Printer.

One Thing They Agreed Upon.

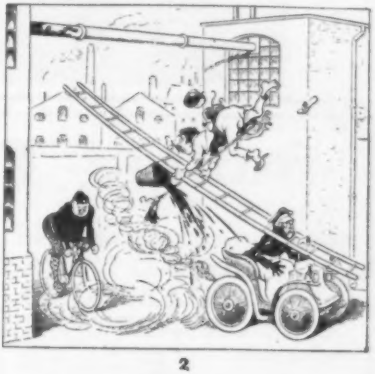
Mistress—Who is that man at the door, Hannah?

New girl—He says he's the rent collector, ma'am.

Mistress—But, Hannah, we don't pay rent.

New girl—That's what he says, ma'am. —Stray Stories.

1



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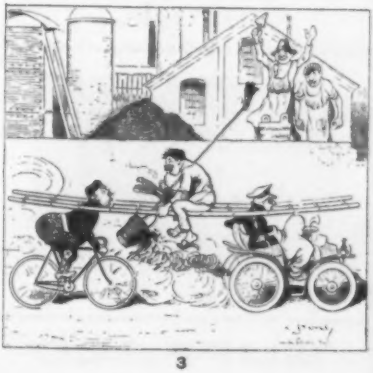


3

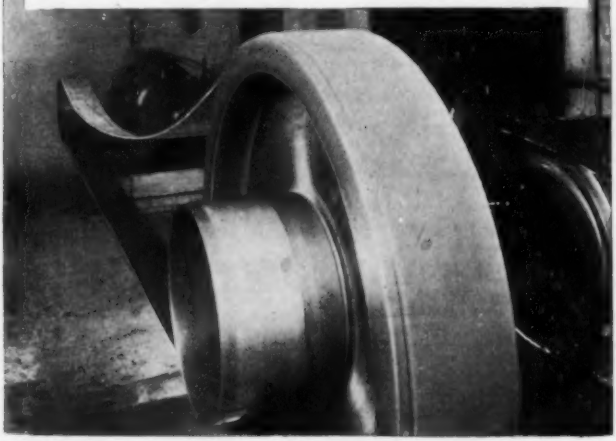
WHAT'S THE FRICTION LOAD IN A MILL WHOSE BELTS RUN THIS WAY?

. TIGHTENING STRAIN ALL GONE. JOURNAL FRICTION CUT IN TWO.

CLING-SURFACE LETS ANY BELT RUN EASY. THIS BELT REPRESENTS 6 YEARS USE BUT RAN THUS AFTER FIRST WEEK. ASK US.

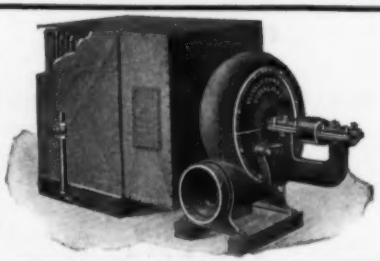
CLING-SURFACE MFG. CO.,
199-205 Virginia St., Buffalo, N. Y.

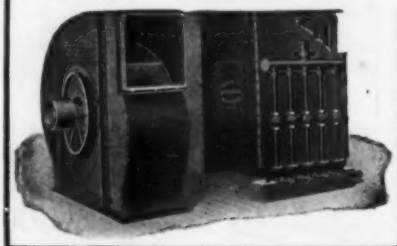
BOSTON NEW YORK PHILADELPHIA



Buffalo Fan System

HEATING—VENTILATING
DRYING
FOR TEXTILE MILLS
AIR CIRCULATION
UNIFORM—POSITIVE and
UNDER COMPLETE
CONTROL.





Buffalo Mechanical Draft Fans

Forced and Induced Draft.
Double your steaming capacity,
Raise your boiler efficiency,
CUT DOWN YOUR COAL BILL.

BUFFALO FORGE CO.,
BUFFALO, N. Y.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Architects and Mill Engineers.
Ferguson, John W., Paterson, N. J.
Gray, Arthur F., Exchange Bldg., Boston.
Green, Samuel M., Holyoke, Mass.
Suck, Adolph, 179 Summer St., Boston.

Attorney-at-Law.
Dawson, H. Horace, 309 Mutual Life Bldg., Philadelphia, Pa.

Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Harwood, Geo. S. & Son, 53 State St., Boston.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila., Pa.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Bands and Labels.
Docker-Foster Co., Phila., Pa.

Baskets.
Crane Bros., Wesefield, Mass.
Lane, W. T. & Bro., Port Chester, N. Y.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.
Jeffrey Manufacturing Co., Columbus, Ohio.
Keystone Leather Belting Works, Norristown, Pa.
Main Belting Co, 1219 Carpenter St, Phila.
Popham, Henry, & Son, Newark, New Jersey.
Shultz Belting Co., St. Louis, Mo.
Smith, Jas. Woolen Mach. Co., Phila, Pa.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Mfg. Co., 168 Virginia St., Buffalo, N. Y.
Keystone Leather Belting Works, Norristown, Pa.
Stephenson Mfg. Co., Albany, N. Y.

Belt Hooks.
Bristol Co., Waterbury, Ct.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Block Cutting for Printing.
Atlas Copper Stamp Works, 15 Whitehall St., New York.

Blowers, and Blower Systems.
American Blower Co., Detroit, Mich.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Mass. Fan Co., Waltham, Mass.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.
Sturtevant, B. F. Co., Boston, Mass.

Bobbins, Spools, Shuttles, Etc.
McGuire, John A, Co, Claremont, N. H.
Southern Bobbin Co., Greensboro, N. C.
Sweet & Doyle, Cohoes, N. Y.
Tebbets, E. L., & Co., Locke's Mill, Me.
Wisconsin Mfg. Co., Two Rivers, Wis.

Boilers.
See Steam Boilers.

Boiler Compounds.
International Boiler Compound Co., 48 Market St., Chicago, Ill.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Boxes Paper.
See Paper Boxes.

Braiding Machinery.
New England Butt Co., Providence, R. I
Textile Machine Works, Reading, Pa.

Braids.
See Tapes, Braids and Edgings.

Brass (Perforated.)
See under Perforated Metal.

Brushes.
Felton, S. A. & Son Co., Manchester, N. H.
Parks & Woolson Mach. Co., Springfield Vt.

Brushers
See Napping Machines.

Burr Pickers.
Atlas Foundry & Mch. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Taunton New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
See also Dyeing, Bleaching Machinery, etc.

Canvas Baskets.
Lane, W. T. & Bro., Port Chester, N. Y.

Carbonizing.
Riverdale Woolen Co., Northbridge, Mass.

Carbonizing Machinery.
Philadelphia Drying Machinery Co., 6731 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Sargent's, C. G. Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Edma Card Clothing Co, 422 S. 5th St, Camden, N. J.
Leigh, Evan A, 35 Mason Building, Boston

Card Feeds.
See Automatic Feeds.

Card Grinding Machinery.
Smith, Jas. Woolen Machinery Co., Phila.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, Jacob K., 2816 N. 4th St, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Parks & Woolson Mach. Co., Springfield, Vt.
Smith, Jas. Woolen Machinery Co., Phila.

Castings.
Livermore, Homer F., 85 Pearl St., Boston.

Chemicals and Apparatus.
Fiedt, Geo. D. & Co, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.
Austen, Peter T., 80 Broad St., New York.

Cling Surface.
Cling Surface Mfg. Co., Buffalo, N. Y.

Clocks.
Howard, E. Clock Co., 403 Washington St., Boston, Mass., 41 Maiden Lane, New York.
Riggs & Brothers, 310 Market St. Philadelphia, Pa.

Cloth Boards.
Chaffee Bros , Oxford, Mass.

Clutches.
American Tool & Machine Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co., Columbus, O.
The Sterling Blower & Pipe Mfg. Co., Hartford, Conn.

Cop Tubes.
See Paper Tubes.

Copper Gaskets.
U. S. Mineral Wool Co., 141 Liberty St., New York.

Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.

Cotton.
Blaisdell. Jr , Co., S., Chicopee, Mass.
Charles, W. B., Amsterdam, N. Y.

Cotton Bale Ties.
DeHaven Mfg. Co., 50 Columbia Heights, Brooklyn, N Y.

Cotton Elevators.
Buffalo Forge Co., Buffalo, N. Y.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.

Cotton Machinery.
Altemus, Jacob K., 2816 N. 4th St, Phila., Pa.
Ashworth, Elijah, Fall River, Mass.
Barber & Colman, 11 Pemberton Sq., Boston.
Brownell, G. L., Worcester, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Houghton, L. T., Worcester, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co., Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowe, Stephen C., 186 Devonshire St., Boston, Agt. John Hetherington & Sons, Ltd.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G , Boston, Mass.
Parks & Woolson Mach. Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Saco & Pettee Machine Shops, Newton, Upper Falls, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas., Woolen Machinery Co., Phila.
Whitin Machinery Wks, Whitinsville, Mass.

Cotton Openers and Lappers.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.

Cotton Softeners.
Bosson & Lane, Boston, Mass.

Cotton Waste.
Blaisdell, Jr., Co., S., Chicopee, Mass.
Charles, W. B., Amsterdam, N. Y.

Credits.
National Mercantile Agency, New York and Boston.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Dating and Time Stamps.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Dextrine.
Elwell, Henry A. & Co., Philadelphia, Pa.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
American Blower Co., Detroit.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville, Mass.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Hunter, Jas., Machine Co., No. Adams Mass.
Kenyon, D. R. & Son., Raritan, N. J.
Mass. Fan Co., Waltham, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co., 34 Oliver St., Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co., Saginaw, Mich.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.

Dyers, Bleachers and Finishers.
Brophy's, T, Sons, Jasper St, Philadelphia
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2560 No. 3rd St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co., Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Howard & Co., Rahway, N. J.
Ingrahamville Dye Works, Pawtucket, R. I.
Kagermann, Edward, 1210 Orianna St., Phila.
Lawrence Dye Works Co., Lawrence, Mass.
Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co. Pawtucket, R. I.
Pennypack Yarn Finishing Co., Holmesburg Pa
Providence Mills Mfg. Co., 55 Girard Ave., Philadelphia. Pa.
Rowland, Samuel, Schuylkill Haven, Pa.
Scranton Yarn Finishing Co., Scranton, Pa.
Union Knitting Mills, Schuylkill Haven, Pa
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Blower Co., Detroit.

Antisdel, E. M., 12 Miller St., Utica, N. Y., (Knit Dryer.)
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch), Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
Dubois, A. N., 2170 Sedgeley Ave., Phila.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St, Philadelphia, Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Rusden Machine Co., Warren, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dye Sticks.
Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M., Philadelphia, Pa.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Baily-Rodgers Co., 34 Moore St., New York.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 88 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston
Cassella Color Co., 182 Front St., New York.
Dillon & Co. 20 Cedar St, New York.
Dubois, A. N., 2170 Sedgeley Ave., Phila.
Elwell, Henry A. & Co., Philadelphia, Pa.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Ford, J. B. Co., Wyandotte, Mich.
Fortner, L. B., 36 Strawberry St., Phila.
Geisenheimer & Co, 189 Front St, New York.
Holliday & Sons, Ltd., Read, 7 Platt St., New York.
Johnson, Chas. A. & Co, 22 Dey St, N. Y
Keller, John J, & Co, 104-106 Murray St, N. Y.
Koechl, Victor, & Co. 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Linnehan, J. W. & Co., 185 High St., Boston.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oil Seeds Pressing Co., 15-25 Whitehall St., New York.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Sykes & Street, 85 Water St, N. Y.
Thayer, Ed. M., 106 Broad St., Boston, Mass.
Vila, H. S., 115 So 2nd St., Philadelphia, Pa

Dynamos and Motors.
General Electric Co., 44 Broad St., New York
New England Machine Co., Pawtucket, R. I.
Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Electrical Construction.
General Electric Co., 44 Broad St., New York.
New England Machine Co., Pawtucket, R.I.

Electric Fans.
American Blower Co., Detroit.
Buffalo Forge Co., Buffalo, N. Y.
General Electric Co., 44 Broad St., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila., Pa
Sturtevant Co., B. F., Boston.

Electric Lighting.
General Electric Co., 44 Broad St., New York.
New England Machine Co., Pawtucket, R. I.

Electric Motors.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven, Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., Lansdowne, Pa and 2123 Market St, Philadelphia, Pa.
Salem Elevator Works, Salem, Mass.

Employers Time Recorders.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Engine Stop.
Locke Regulator Co., Salem, Mass.

Exhaust Heads.
Burt Manufacturing Co., Akron, Ohio.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.
The Sterling Blower & Pipe Mfg, Co., 44 Hupshope St, Hartford, Conn.
Sturtevant, B. F. Co., Boston, Mass.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co., Matteawan N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa
Scaife, W. B. & Sons, Pittsburg, Pa.

Feeds.
See Automatic Feeds.

Filters.
Automatic Water Purifying Co., 45 Broadway, N. Y.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.
Scaife, W. B. & Sons, Pittsburg, Pa.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.
Cohoes Foundry & Machine Co., Cohoes, N.Y
Thurston, A. G. & Son, Box 528, Fall River, Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Friction Clutches.
See Clutches.

Friction Hoisting Drums.
Eastern Machinery Co., New Haven, Conn.

Fuel Economizers.
Green Fuel Economizer Co., Matteawan, N. Y.
Steam Boiler Equipment Co., 29 West Houston St., New York.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R. & Son, Raritan, N. J.

Garnetts.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B. F., Boston.

Gauges.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.

Gears.
New Process Raw Hide Co., Syracuse, N. Y.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
The Eastern Machinery Co., New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Labels.
Docker, Foster Co., Philadelphia, Pa.
Saranac Electrical Mfg. Co., St. Joseph, Mich.

Hosiery Boards.
Pearson, J. T, Kensington. Pa.
Wisconsin Mfg. Co., Two Rivers, Wis.

Humidifying Apparatus.
American Air Moistening Co., Boston.

Hydro Extractors.
American Tool & Machine Co., Boston.
Rusden Machine Co., Warren, R. I.

Ironing Machines for Knit Goods.
Craw, J. W. Laundry Machinery Co., So. Norwalk, Conn.

Jacquard Cards.
Rogers, H. E, South Manchester, Conn.

Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Chapin, Geo. W. Philadelphia, Pa.
Charles, W, B., Amsterdam, N. Y.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger Mfg Co, Edgings, Germantown, Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Arnold Sewing Machine Co., 216 High St., Newark, N. J.
Craw, J. W. Laundry Machinery Co., So. Norwalk, Conn.
Merrow Machine Co, The. Hartford, Conn.
Nye & Tredick Co., 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.
Willcox & Gibbs Sewing Mch. Co., New York.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
American Knitting Machine Co., 6th and Arch St., Philadelphia, Pa.
Antisdel, E. M., 12 Miller St., Utica, N Y.
Babcock Machine Works, Fort Plain, N. Y.
Branson Machine Co., 506 N. American St., Philadelphia.
Brinton, H. & Co., 213 Race St., Philadelphia, Pa.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Dresdner Strickmaschinenfabrik, Irmscher & Co. Dresden-Lobtau, Germany.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y
Keystone Knitting Machine Mfg. Co., 40 N 7th St., Phila.
Lamb Knitting Mach. Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Ludwig, E. H, Hawley, Pa.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
Nye & Tredick Co., 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mch. Works, Lakeport, N. H.
Ruth & Co., Norristown, Pa.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.
Tompkins Bros., Troy, N. Y.

Knitting Needles and Supplies.
Breedon, Wm. & Son, Amsterdam, N. Y.
Brinton, H. & Co., 213 Race St., Philadelphia, Pa.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co., 40 N 7th St., Philadelphia.
Lamb Knitting Machine Mfg. Co., Chicopee Falls, Mass.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Knotter for Spoolers.
Barber & Colman, 11 Pemberton Sq., Boston

Labeling Machine.
Saranac Electrical Mfg. Co., St. Joseph, Mich.

Laboratory Outfits.
Feidt, Geo. D. & Co, 528 Arch St. Phila, Pa.

Leather.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.

Leather Boards.
Rogers, H. E, South Manchester, Conn.

Looms.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 23d and Wood Sts. Philadelphia.
Howard, Geo. C., Lansdowne, Pa. and 2128 Market St., Philadelphia, Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Whitin Machine Works, Whitinsville, Ms.

Loopers.
Beattie's Machine Works, Cohoes, N. Y.

Lubricators
Dixon, Jos., Crucible Co, Jersey City, N. J.
Pittsburgh Gage & Supply Co., Pittsburgh Pa.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Grant & Williams, Park Row Bldg., New York.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.
Schofield, Geo, L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia

Machinists.
New England Machine Co., Pawtucket, R. I.

Machinists' Tools.
Dodge Mfg. Co., Mishawaka, Ind.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.
Parks & Woolson Mach. Co., Springfield Vt.

Mechanical Draft.
American Blower Co., Detroit.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co, Buffalo., N. Y.
Sturtevant, B. F. Co., Boston, Mass.

Mechanical Engineers.
American Blower Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.

Green, Samuel M., Holyoke, Mass.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
Sturtevant Co., B. F., Boston.
Suck, Adolph, 179 Summer St., Boston.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Rusden Machine Co., Warren, R. I.

Mill Architects.
See Architects & Mill Engineers.

Mill Baskets.
Crane Bros., Westfield, Mass.
Lane, W. T. & Bro., Port Chester, N. Y.

Mill Brushes.
See Brushes.

Mill Builders and Engineers.
Ferguson, John W, Paterson, N. J.

Mill Sewing Machines.
(See Sewing Machines and Supplies.)

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Chase Pulley Co., Providence, R. I.
Dixon Lubricating Saddle Co., Bristol, R.I
Dodge Mfg. Co., Mishawaka, Ind.
Easton-Burnham Co., Pawtucket, R. I.
Houghton, E. F. & Co., 3rd and Somerset Sts , Phila.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Keystone Leather Belting Works, Norristown, Pa.
Lane, W. T. & Bro., Port Chester, N. Y.
Main Belting Co, 1219 Carpenter St, Phila.
Oil Seeds Pressing Co., 15-25 Whitehall St., New York.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.
Shaw, Victor, Ring Traveller Co., Providence, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Southern Bobbin Co., Greensboro, N. C.
Stephenson Mfg. Co., Albany, N. Y.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
Sweet & Doyle, Cohoes, N. Y
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
Columbia Napping Machine Co., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Mach. Co., Springfield, Vt.

Nails (Silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Oil Cups.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.

Oils.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.
Oil Seeds Pressing Co., 15-25 Whitehall St. New York.
Stephenson Mfg. Co., Albany, N. Y.

Oilless Bearings.
Arguto Oilless Bearing Co, Wayne Junction, Phila.

Overhead Tracks.
Putnam & Co., 150 Nassau St., New York. N. Y.

Overseaming Machines.
Arnold Sewing Machine Co., 216 High St., Newark, N. J.
Merrow Machine Co., Hartford, Conn.
Union Special Sewing Machine Co., 75 Kinzie St., Chicago, Ill.
Von Buchwald, W. J., 120 No. 7th St., Phila.
Wilcox & Gibbs Sewing Machine Co., New York.

Oxidizing Machinery.
Dubois, A. N., 2170 Sedgeley Ave., Phila.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 23 Dey St, New York.

Paper Tubes.
Sayford Paper Specialty Co., Camden, N. J.

Patent Solicitors.
Crosby & Gregory, 24 School St, Boston.
Siggers, E. G., Washington, D. C.
Straley, Hasbrouck & Schloeder, 257 Broadway, New York.

Perforated Metals.
Beckley, A. J. & Co., 248 Pearl St., New York.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Southern Bobbin Co., Greensboro, N. C.

Pipe Covering.
Keasbey, R. A, 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
Chase Pulley Co., Providence, R. I.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St , Philadelphia, Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.
Rusden Machine Co., Warren, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Saginaw Manufacturing Co., Saginaw, Mich.
Smith, Jas. Woolen Machinery Co., Phila.

Preparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Press Boards and Fenders.
Rogers, H. E, South Manchester, Conn.

Presses.
Boomer & Boschert Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., Lansdowne, Pa and 2123 Market St. Philadelphia, Pa.
Phillips Co. The Thomas, Providence, R. I.
Spence & Rideout, Nashua, N. H.
(Power, Screw, Hydraulic, Hollow Steam Plate).

Pulleys.
See Power Transmitting Machinery.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Purifying & Filtration Plants.
Scaife, W B. & Sons, Pittsburg, Pa.

Rag Pickers.
Smith, Jas. Woolen Mach. Co., Phila, Pa.

Raw Hide Gears.
New Process Raw Hide Co., Syracuse, N. Y

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Walder, J, Paterson, N. J.

Remnants.
Feingold, H. & D., 91 Bedford St., Boston.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
DeHaven Mfg. Co, 50 Columbia Heights, Brooklyn, N. Y.
National Ring Traveller Co., Providence, R. I.
Shaw, Victor, Ring Traveller Co., Providence, R. I.

Rope Transmission.
Dodge Mfg. Co., Mishawaka, Ind.

Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 960 Manton Ave, Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I

Scales
Sweet& Doyle, Cohoes, N. Y.

Scallop Machines.
Merrow Machine Co., Hartford, Conn.

Schools.
International Correspondence Schools, Scranton, Pa.
Lowell Textile School, Lowell, Mass.
New Bedford Textile School, New Bedford, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.
Arnold Sewing Machine Co., 216 High St,. Newark, N. J.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch), Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co., Salem, Mass.
Fales, L. F., Walpole, Mass.
Goldstein, I., 505 Arch St., Phila.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Rusden Machine Co., Warren, R. I.
Union Button Sewing Mch. Co., 164 High St., Boston.
Union Special Sewing Machine Co., 75 Kinzie St., Chicago, Ill.
Von Buchwald, W. J., 120 No. 7th St., Phila.
Willcox & Gibbs S. M. Co., New York.

Shafting Hangers, Etc.
See Power Transmission Machinery.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co. Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Shuttle Checks.
Victor Shuttle Check Co., Auburn, N. Y.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.

Screens (Perforated.)
See under Perforated Metal.

Selling Agents.
See Commission Merchants.

Separators.
Draper Co., The, Hopedale, Mass.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch). Somerville. Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Arabol Mfg. Co., 155 William St., New York.
Elwell, Henry A. & Co., Philadelphia, Pa.
O. K. Soap Co., 968 Franklin St., Phila.
Stein, Hirsch & Co, 165 Duane St, New York.

Skylights.
Drouve Co., G., Bridgeport, Conn.

Slashers.
Cohoes F'ndry & Machine Co, Cohoes, N. Y
Lowell Machine Shop, Lowell, Mass.

Soaps.
Elwell, Henry A. & Co., Philadelphia, Pa.
India Alkali Works, Boston, Mass.
O. K. Soap Co., 968 Franklin St., Phila.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj'a, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Vandergrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 960 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Spooler Knotter.
Barber & Colman, 11 Pemberton Sq., Boston.

Stamps for Hosiery.
Atlas Copper Stamp Works, 15 Whitehall St., N. Y.
Wells, Wilfred, 505 W. Lehigh Ave., Phila.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co., Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co Hamilton, O.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.

Steam Surface Coverings.
Keasbey, Robert A., New York.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.
Jenkins Bros., New York.
Locke Regulator Co., Salem, Mass.
New York Lubricating Oil Co., 35 Water St., New York.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.
Rusden Machine Co., Warren, R. I.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
Sturtevant Co., B. F., Boston.

Steam Valves.
Jenkins Bros., New York.

Stop Motion for Looms.
See, Warp Stop Motions.

Tanks, Tubs and Vats.
Davis, G. M. & Son, Palatka, Fla.
Cypress Lumber Co, Apalachicola, Fla.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co., Warren, R. I.
Stearns, A. T. Lumber Co, Neponset, Mass.
Stevens, D. B. & Co., Auburn, Me.
Woolford, George, 2240 No. 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Cathcart, John, & Co, 115 Franklin St, N. Y
Chapin, Geo. W. Philadelphia Pa.
Friedberger Mfg. Co, Germantown, Pa.

Hamilton, J. H. & Co., 84 Franklin St., N. Y.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.

Temples.
Draper Co., Hopedale, Mass.

Tension Pulleys.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
N. E. Ventilating & Heating Co, 990 Manton Ave, Providence, R. I.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
See Dyeing, Drying, Bleaching and Finishing Machinery.

Testing Machines.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.

Textile Schools.
See Schools.

Thread Board for Spinning & Twisting Frames.
Houghton, L. T. Worcester, Mass.

Tickets and Labels.
Saranac Electrical Mfg. Co., St. Joseph, Mich.

Tower Clocks.
Howard E. Clock Co., 403 Washington St., Boston; 41 Maiden Lane, New York.

Trucks.
Slingsby H. C., 253 Broadway, New York.

Turbine Governors.
Replogle Governor Works, Akron, O.

Turbines.
(See Water Wheels.)

Twine Machinery.
Brownell, G. L, Worcester, Mass.

Twisting Machinery.
Brownell, G. L., Worcester, Mass.
Bullock, Mach Co., O. S., 179 Broadway, Cambridgeport, Mass.

Valves.
Boston Belting Co., Boston, Mass.
Locke Regulator Co., Salem, Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co, Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Drouve Co., G., Bridgeport, Conn.
Massachusetts Fan Co., Waltham, Mass.
New England Ventilating & Heating Co, Providence. R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Warp Stop Motions.
Draper Co., Hopedale, Mass.

Washers (Cloth).
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville, Mass
Butterworth, H. W. & Sons Co., Philadel.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass
Kenyon, D. R., & Son, Raritan, N. J.
Rusden Machine Co, Warren, R. I.

Washing Soda.
Ford, J. B. Co., Wyandotte, Mich.

Watchman's Clocks.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Howard, E. Clock Co., 403 Washington St., Boston, Mass., 41 Maiden Lane, New York.
Nanz & Co. 127 Duane St., New York.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Water Purifiers & Filters.
Automatic Water Purifying Co., 45 Broadway, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Water Wheels.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Replogle Governor Works, Broadway and Chestnut Sts., Akron, Ohio.

Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.

Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.

Winders. (Hosiery.)
Altemus, Jacob K., Philadelphia.
Foster Machine Co., Westfield, Mass.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y.
Universal Winding Co, 95 South Street, Boston.

Wood Pulleys.
Chase Pulley Co., Providence, R. I.
Dodge Mfg. Co., Mishawaka, Ind.
Pittsburgh Gage & Supply Co., Pittsburgh, Pa.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool Cleaning Compound.
Ford, J. B. Co., Wyandotte, Mich.
India Alkali Works, Boston.

Wool Combing Machinery.
Leigh, Evan A. 35 Mason Bldg., Boston.

Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Stillman, Victor C., Westerly, R. I.

Woolen and Worsted Machinery.
Altemus, Jacob K., 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N.J.
Birch Brothers (Albert Birch), Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Fales, L. F, Walpole, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Harwood, Geo. S. & Son, 53 State St., Boston.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co. No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kensington Machine Works, Mascher St., below Lehigh Ave., Phila.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia, Pa.
Lowe, Stephen C., 186 Devonshire St., Boston. Agt. John Hetherington & Sons, Ltd.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas. Woolen Machinery Co., Phila.

Wool Oiling Apparatus.
Harwood, Geo. S. & Son, 53 State St., Boston.

Wool Shoddies.
Riverdale Woolen Co, Northbridge, Mass.
Slack, Wm. H. B., & Bro, Springfield, Vt.

Wool Washing, Preparing and Drying Machinery.
Hunter, Jas. Machine Co., No. Adams, Mass.

Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

YARNS, THREADS, ETC.

Banding.

Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Tucker & Cook Mfg. Co, Conway, Mass.
Toohey, M. J. & Co., Fall River, Mass.
Whittier Mills, Chattahoochee, Ga , Treasurer's Office, Springfield, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Ballou Yarn Co., Providence, R. I.
Blythe, Richard A., 114 Chestnut st., Phila.
Buckingham Paulson Co., 83 Leonard St. New York.
Catlin & Co, New York, Boston, Phila. and Chicago.
Chapin, Geo. W., 229 Church St., Phila., Pa.
Charles, W. B., Amsterdam, N. Y.
Dana Warp Mills, Westbrook Me.
Dexter Yarn Co., Pawtucket, R. I.
Dodds, J. S., 517 Wool Exchange, New York.
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E. & Co, Boston and Phila. Pa.
Moeller & Littauer, 109 Greene St , New York.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Morgan, E. A., 54 Franklin St., N. Y.
Orswell Mills, Fitchburg, Mass
Salkeld, A. D. & Bro., 66 Leonard St., N. Y.
Tucker & Cook Mfg. Co, Conway, Mass
Whittier Mills, Chattaeoochee, Ga., Treas. Office, Springfield, Mass.

Cotton Yarns Wool Spun.

Broadbent, J. & Sons, Unionville, Conn.

Flax, Hemp, Jute and Ramie.

Fawcett, Hughes, 115 Franklin St., N. Y
Eichmann & Sternberg, 530 Broadway, N. Y.
Morgan, E. A., 54 Franklin St., N. Y.

Gassed Yarns.

Ballou Yarn Co., Providence, R. I.
Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, New York.
Greene & Daniels Mfg. Co, Pawtucket, R. I.

Glazed Yarns.

Ballou Yarn Co., Providence R. I.
Blythe, Richard A., 114 Chestnut St., Phila.
Chapin, Geo. W., 229 Church St , Phila., Pa.
Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M., Leominster, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co. N. Y.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office. Springfield, Mass.

Harness Twine.

Ballou Yarn Co., Providence, R. I.
Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Morgan, E. A., 54 Franklin St., N. Y.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office. Springfield, Mass.

Hosiery and Knitting Yarns.

Blythe, Richard A., 114 Chestnut St., Phila
Boyer, B. F. Co., Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn.
Cranston Worsted Mills, Bristol, R. I.
Chapin, Geo. W., 229 Church St., Phila., Pa
Dexter Yarn Co., Pawtucket, R. I.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Herbst, Albert & Co., E. Allegheny Ave., Philadelphia.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic Mass.
Moeller & Littauer, 109 Greene St., New York.
Queensbury Mills, Worcester, Mass.
Skerry, A. T, & Co., 47 Leonard St., N.Y.

Mercerized Yarns.

Blythe, Richard A. 114 Chestnut St., Phila.
Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, 530 Broadway, N. Y.
Harper, E. J., 395 Broadway, New York.
Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co., Philadelphia.
Montgomery, J. R. & Co., Windsor Locks. Conn.
Morgan, E. A., 54 Franklin St., N. Y.
Pennypack Yarn Finishing Co., Holmesburg, Pa.

Mohair Yarns.

Cranston Worsted Mills, Bristol, R. I.
Montgomery & Co, J. R, Windsor Locks, Ct.
Morgan, E. A., 54 Franklin St., N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, 530 Broadway, N.Y.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Moeller & Littauer, 109 Greene St., New York.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard, St, N. Y.

Silk Yarns.

Chapin, Geo. W., 229 Church St., Phila., Pa.
Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, N Y.
Moeller & Littauer, 109 Greene St., New York.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F. Co., Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn.
Eaton Rapids Woolen Mills, Eaton Rapids, Mich.
Eddy & Street, Providence, R. I.
Harper, E. J. 395 Broadway, New York.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co.. Pawtucket, R. I.
Moeller & Littauer, 109 Greene St., New York.
Rockwell, E. M, Leominster, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y
Skerry, A. T. & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Speed, James, 170 Summer St , Boston.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Boyer, B. F. Co, Camden, N. J.
Campion, Richard, 17 Bank St., Phila.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Harper, E. G., 395 Broadway, New York.
Herbst, Albert, & Co., E. Allegheny Ave., Philadelphia.
Moeller & Littauer, 109 Greene St., New York.
Pocasset Worsted Co., Thornton, R. I.
Queensbury Mills, Worcester, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y
Skerry, A. T, & Co. 47 Leonard St, N. Y.
Speed, James, 170 Summer St., Boston

JEFFREY ELEVATING, CONVEYING, POWER TRANSMISSION MACHINERY FOR CATALOGUE, ADDRESS THE JEFFREY MFG. CO. COLUMBUS, O.

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Stein, Hirsch & Co.,	805
Stephenson Mfg. Co.	648
Sterling Blower & Pipe Mfg. Co., The	644
Stevens, D. B. & Co.,	809
Stillman, V. C.,	771
Straley, Hasbrouch & Schloeder	663
Sturtevant, B. F. Co.,	Inside Back Cover
Suck, Adolph,	780
Sweet & Doyle	653
Sykes & Street,	803
Taunton-New Bedford Copper Co.,	806
Taylor, Jas.	817
Tebbets, E. L. & Co.,	643
Thayer, Edward M., & Co.	802
Thun & Janssen	641
Thurston, A. G. & Son,	772
Tompkins Bros.	828
Toohey, M. J. & Co.	784
Torrance Mfg. Co.,	810
Townsend, Thomas	650
Treat, Orion,	829
Tucker & Cook Mfg. Co.,	787
Union Button Sewing Mch. Co.,	827
Union Knitting Mills	803
Union Special Sewing Machine Co.,	825
United States Mineral Wool Co.	653
Universal Winding Co.,	651
Victor Shuttle Check Co., The,	644
Vila, H. S.	805
Von Buchwald, W. J.	822
Walcott & Campbell Spinning Co,	787
Walder, J.,	642
Walrus Fibre Mfg Co.,	648
Ward & Vandegrift	640
Wardwell Needle Co.,	829
Watson, L. S, Mfg. Co,	640
Weimar Bros.	779
Wells, Wilfred	817
Whitcomb, H. C, & Co,	648
Whitin Machine Works,	630
Whitinsville Spinning Ring Co.,	641
Whiton D. E. Machine Co.,	654
Whittier Mills,	790
Willcox & Gibbs Sewing Machine Co	824
Wisconsin Mfg. Co.,	826
Woolford, G., Wood & Tank Mfg.	808
Young, Wm. M.,	781

FACTORY WASTES.

I have found ways to utilize many wastes and unapplied substances, converting losses into profits. Send for Waste Product Blank and Pamphlet.

DR, PETER T. AUSTEN, F.C.S., Chemical Expert.

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WE WANT MACHINERY TO BUILD.

We can do the whole, —drawings, patterns, castings, and build machines complete, or any part of the work you want from start to finish, at most reasonable prices.

NEW ENGLAND MACHINE CO., Pawtucket, R. I.

Machinists and Electrical Contractors.

WHEN YOU HAVE OLD SPINDLES

of any kind FOR SALE send a postal card for our prices. We also buy Second-hand Machinery and Scrap Iron.

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Factory Buildings and Power For Sale.

Main Building 280x50 feet. 2 stories. Brick with metal roof.

L 40x90 feet. 1 story. Brick with metal roof.

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Shop 20x30 feet. 1 story. Brick with metal roof.

Also, Cotton Gin House and Warehouse. 200 h. p. (water power). 40 year lease at $5.00 per h. p. per annum.

A GREAT BARGAIN.

J. D. KENNEDY, - Mammoth Springs, Ark.

WOOLEN MILLS.

We want Woolen Mills at Sault Ste. Marie. We offer manufacturers abundance of cheap electric power from the 50,000 horse power canal and plant, utilizing the waters of Lake Superior, just completed; free sites and a remission of local taxes. Wool supply from Michigan and the Montana ranges. Labor supply ample. Rail and water routes east, west and south, and lowest rates. Advantages for nearly all kinds of manufacturing. Information gladly given.

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Chamber of Commerce,
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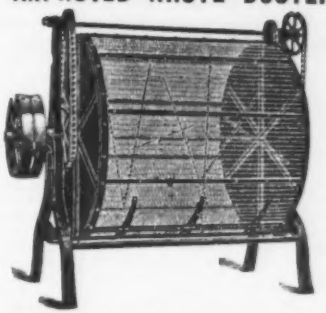

For Cleaning Wool Waste. Superior to any now in use.

V. C. Stillman, Westerly, R. I.
Send for Circular.

WANTED.

Cotton Yarn Salesman.

An energetic salesman for the Middle West on cotton yarns and warps for knitters and woolen mills. Must be experienced and provide acceptable references. State age and salary expected. Address Salesman, care Textile World, Boston, Mass.

Superintendent Wanted

For Southern Mill, manufacturing a good grade of hosiery. No applications will be entertained unless accompanied by references and price expected. Address South, care Textile World.

KNITTING MACHINERY FOR SALE.

1	N. & T.	Automatic	Underwear	Machine,	13	inch.	324	Needles,	four	feed.
8	"	"	"	"	12½	"	312	"	"	"
1	S. & W.	"	"	"	11	"	276	"	"	"
1	"	"	"	"	11	"	276	"	eight	"
3	N. & T.	"	Sleevers		3¾	"	73	"	two	"
4	"	"	"		4	"	88	"	"	"

These machines are all, except the eight feed, in first class condition and will be sold cheap.

WM. S. LLOYD, - Wayne Junction, Phildadelphia.

EDWARD JEFFERSON & BRO.,

Worsted .·. Machinery,

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J. B. Farrar & Sons, Halifax, England,

Briggella Cork Rollers for Spinning and Drawing.

IF YOU WANT COTTON OR WOOLEN MACHINERY

...Why not correspond with...

GEO. L. SCHOFIELD,

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Also, Agent for the Weston Hydro Extractor.

A. G. THURSTON & SON,

—MANUFACTURERS OF—

Fluted Rolls, Pressers for Flyers and General Machinery.

Specialties made of Renecking, Refluting, Filing and Honing all kinds of Rolls.

Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straighten Restepped and Retopped.

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Don't dam your boiler.

with scale and crust. Our booklet by DR. A. M. KINKAID explains how to prevent trouble with boilers. Sent free to advertise our **New Brick Form Boiler Compound.** Your engineer needs it. Drop postal to

INTERNATIONAL BOILER COMPOUND CO., 48 Market St., Chicago.

Western Woolen Mill and Clothing Factory For Sale,

Located at Rochester, Minnesota, a beautiful city of 7000 population on the C. & N. W. R. R.

The Woolen Mill contains 3 sets of 40-inch cards equipped with Bramwell & Apperly feeds; four mules with 920 Spindles, a Double and Twist Machine having 60 Spindles, also the usual Spooling and Warping Machinery including a Warp Compressor; fourteen Broad Looms, two of which are Knowles latest make, eight Cromptons and four D. & F. The mill is equipped with finishing machinery for turning out 7,500 yards 6-4 fancy cassimere monthly. All the wool required is grown in the immediate vicinity. The Clothing Factory is operated in connection with the Woolen Mill cutting up its entire product into Men's Cassimere Pants for which there is a large and increasing demand; it is fully equipped with first-class machinery, steam heated and electric lighted, and the building is sufficiently large to accommodate additional machinery for the manufacture of Ladies' Walking Skirts or other articles if desired. The entire product of the two plants can be sold within a radius of 200 miles. The plants will be sold separately or jointly if desired. Anyone desiring an established business will find here an opportunity seldom offered. Prices and full particulars upon application.

ROCHESTER WOOLEN MFG. CO.

SUPERINTENDENT.

Narrow Fabrics, Tapes, Etc.; a New England mill making this class of goods wants a good reliable man, capable of taking full charge. To a man who has got energy and perseverance, we are disposed to make a good offer. Address with full particulars, "Perseverance," care Textile World, Boston.

WANTED.

Several men of good appearance, good talkers, with a knowledge of Textile manufacturing to solicit and collect for our School of Textiles in textile centres in New England. Good opportunity for the right men. Address with particulars, Textile Department, International Correspondence Schools, 702 Colonial Building, Boston, Mass

MILL WANTED.

At town situated in centre of cotton belt of Texas. Excellent railroad facilities. An abundance of cheap fuel and water. Cheap homes. Liberal encouragement by citizens. Correspondence solicited from all interested. WYLIE BOARD OF TRADE,

Wylie, Texas.

WANTED.

Foreman for Winding Room in a large Knitting Mill. Address W. M., care Textile World, Boston, Mass.

H. Horace Dawson, ATTORNEY AND COUNSELLOR-AT-LAW, 309-310 Mutual Life Bldg., Phila., Pa.

Special attention given to Bankruptcy Claims and Collections.

SITUATIONS WANTED.

COTTON SUPERINTENDENTS.

1532 **Supt.** of cotton mill, a thoroughly capable man, is open to a position. Well up on English and American makes of machinery. Has manufactured yarns both in American and Egyptian cottons, from 17s to 70s. About 40 years of age; Scotch. Has held a responsible position in a New England company for the past 10 years.

1975 **A Linen Manufacturer**, who thoroughly understands linen and cotton fancy goods and damasks, is open to position as Supt. 40 years of age, Irish, married. Can refer to well-known mill owners. Terms reasonable.

2021 **Supt., Overseer of Carding,** assistant designer. Worked on sheetings and ginghams. Held position of overseer of carding and assistant to manager for past few years. Age 41; American. First class references.

1877 **Agent or Treasurer.** Good references. Recently assistant manager of a large mill. Fully competent.

1853 **Supt. Cotton Mill,** or would take an overseer's position in a large mill North for the present. Has been assistant superintendent for past year, previous to which he was overseer of carding for nine years, and before that was overseer of carding and spinning in the South. First-class references. Can take position at once. Colored and white goods. English and American machinery.

2011 **Wanted,** a position as assistant superintendent of a fancy weaving mill, by a man having a thorough practical knowledge of weaving and designing. Age 32; married.

ASSISTANT SUPERINTENDENT.

A young man, 27 years old; unmarried; who has had experience in every department of a cotton mill and thorough training, with the idea of learning the business, would like to secure a position as assistant to a cotton manufacturer or as assistant superintendent in some large mill. Opportunity for advancement is more of an object than immediate salary. Has acted as overseer in several departments for some time. Address "Russell," care of Textile World

WOOLEN SUPERINTENDENTS.

1982 **Supt.** of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as supt. or designer. Age 45; American; married. Good references.

2028 **Supt.** woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills

1537 **Woolen Superintendent, Designer or Weaver.** Has worked on all classes of woolens, worsteds, cotton worsteds, fancy cassimeres, etc., and is acquainted with all Eastern makes of machinery. American. Age 34; married.

2053 **Agent,** or supt., or supt. and designer. Good manager of help and a hustler. Thoroughly understands manufacture of shoddy in all its branches, including carbonizing and extracting. Familiar with all manipulations of wool, shoddy and cotton. Fully competent to take agent's position, as is a good wool buyer, and can figure all prices on goods and percentages, etc.

1890 **Manager or Supt.** of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references.

1974 **Asst. Supt.** or Designer, woolen or worsted, who understands designing and also the work of every department. Has worked on fine worsteds, coverts, cheviots kerseys, meltons and fancy cassimeres. Technical education acquired at Phila. Textile School. Six years' practical experience, three as designer. Age 24, American, good references. Will go anywhere.

1936 **Supt. or Designer,** an American, married. 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to-date in methods. Moderate wage.

Slingsby's Patent.

Runs both ways and Spins like a top.

Wool Trucks,
Yarn Trucks,
Cloth Trucks,
Dye House Trucks,
IN FACT,
ANYTHING IN TRUCKS.

H. C. SLINGSBY,
253 Broadway, NEW YORK.
Canadian Office, Montreal.

WOOLEN CARDERS.

2000 **Secondhand Carder** familiar with all wool, wool and cotton and shoddy mixes on Davis & Furber and Furbush cards would like to obtain a position. 21 years old, American. Good references.

2057 **Carder,** or carder and spinner. Age 28; German; married. All wool, wool and cotton and shoddy mixes Davis & Furber, James Smith and Lombard machines.

2055 **Boss Carder.** Cotton, woolen, worsted and silk mixes of all kinds. Can take place at once, and wants not less than $3 per day. Age 48; American; married. Excellent references and experience.

2041 **Second hand of** large or overseer of small carding room is open to a position. 27 years old; American; married. Has had 12 years' experience on wool, wool and cotton, all shoddy and all grades of yarn. Now employed as second hand, but feels capable of taking charge of small room.

2046 **Boss Wool Carder** is open to a position. Age 45; American; married. Is familiar with most all classes of woolens. Will not go West or South. Thoroughly understands mixing and blending together different kinds of stock

2069 **Overseer of Woolen Carding,** age 32; American; married. Good experience and excellent references. Worked in kersey-, meltons, cheviots, cassimeres, coverts, dress goods broad cloths, etc.

COTTON CARDERS.

2054 **Overseer of Cotton Carding** or combing. Englishman; 47 years old; married. Wants not less than $3.

2060 **Overseer of Carding** on cotton and purely white work. Thoroughly understands combing. Is familiar with most all kinds of machinery, both English and American.

2063 **Overseer of Carding.** Age 34; American; married. Worked mostly on yarns, combed and carded. Wants $3.50 or more, according to position

2001 **Overseer of Carding** who has had experience in some very large cotton mills in Massachusetts wishes to obtain a position. Understands the running of both coarse and fine goods and is familiar with all makes of cards. 41 years of age; American; married. Good references. Moderate wages.

2022 **Overseer of Carding.** Age 47; American; married. Worked on both wool and cotton. Is familiar with Davis & Furber and James Smith machinery

1932 **Overseer of Carding** or would take assistant superintendent position. Age 27; American; single. Carded and combed American, Egyptian and Sea Island Cotton, making yarns from 8s to 100s; both plain and colored goods. Can come at once

1919 **Overseer Cotton Carding and** Spinning, who has had an experience of over 10 years in N. E. and New York mills, is open to a position. 26 years old; American; single. Thoroughly competent and reliable. Best of references.

WOOLEN SPINNERS.

1784 **Worsted Drawer and Spinner** Would take twisting. Age 28; English; single. Can furnish references as to ability and character.

2040 **Overseer of Ring or Frame Spinning,** or would take superintendent position. Age 41; married.

1969 **Overseer** of woolen spinning would like a position in a good mill. Has worked on woolen, cotton mixes, and shoddies from 1 to 3Rs. 26 years of age temperate and steady. Good references.

1987 **Overseer** of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability.

1834 **Overseer of Spinning.** Experience covers eight years as second-hand and fixer and eleven years as overseer. Has handled nearly all kinds of goods. Is an expert fixer. Worked on Davis & Furber mules. Age 38; American; married.

COTTON SPINNERS.

1960 **Overseer of Cone Winding** and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4s to 160s; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills.

1950 **Overseer** or second-hand of cotton mule spinning desires a position in the Southern States at reasonable wages. Is a good fixer and has made yarns ranging from 4s to 40s. 39 years old; German; married. Best of references. One worker in family—drawer in.

2020 **Overseer of Ring Spinning** or asst. supt. Age 29; English; unmarried. Is familiar with all grades of cotton. Good experience and excellent references.

2003 **Overseer of Mule Spinning** who has had a wide experience in large New England mills on yarns ranging from 24s to 160s is open to a position. 37 years old; American. Good references.

1690 **Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with.

1519 **Overseer Spinning.** Age 31; American; married Has worked on yarns from one run to 5¼. Will accept an average salary. At present employed, but wishes to better himself.

1862 **Overseer of Spinning.** Familiar with Johnson & Bassett, Davis & Furber and Campbell & Clute machines. Has had 18 years' experience as an overseer, and is a handy man. Excellent references.

WOOLEN WEAVERS.

1959 **Boss Weaver,** who is familiar with cotton, woolen and worsted looms, and all classes of goods, is open to a position in a large mill. 46 years of age; American; married. Strictly temperate and is recommended by some very large N. E. woolen and cotton mills.

1964 **Boss Weaver,** familiar with all makes of woolen and worsted machinery, and who has worked on ladies' dress goods and men's wear, desires a position. 39 years of age; American; married. Can give good references.

2051 **Overseer of Weaving** or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation.

2019 **Boss Weaver** or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference.

2008 **Overseer of woolen** or worsted weaving. Would consider second hand or good fixing job. Age 37; married; American. Wants N. E. States. Worked on all classes of woolen and worsted goods, including paper makers' felts. All kinds of harness looms.

866 **Boss Weaver** or Assistant Superintendent. Age 31; American; married Worked on nearly all classes of ladies' and men's wear goods, both wool and worsted.

COTTON WEAVERS.

2034 **Overseer of Weaving** is open to a position. Age 33; American; married. White sheetings and drills. Mason, Whitin, Lowell and Knowles looms. Wants work in Western or Southern States. Experienced fixer and overseer.

1806 **Practical Boss Weaver** and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and for getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute.

2039 **Overseer of Weaving.** Has had charge of winding and warping and slashing. 18 years' experience in cotton mills, and can give the best of references as to ability. Worked in some of the best mills in the country as loom fixer, second-hand and overseer. Plain, leno and fancy goods.

2058 **Overseer of Weaving** or designing. Age 38; English. All kinds of cotton dress goods, also suitings. Both English and American machinery. Wants not less than $3.50 per day.

2016 **Overseer of Weaving.** Age 35; Scotch; married. Good experience, and excellent references. Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods.

KNITTERS.

1993 **Boss Knitter and Fixer** on ladies' and gents' ribbed underwear on S. & W., N. & T., M. & W., B. & D., S. & H., Huse, Champion, S. & F. machines is open to a position in any part of the United States. 30 years old; American; married. Good references. Wants $4.

2062 **Foreman of Knitting Room,** spring needle or flat knitting. Age 28. Fleeces of all kinds and gauges, balbriggan from 20 to 30 gauge, flat wool work all gauges. Is familiar with Tompkins Bros., Campbell & Clute and Crane machines.

1951 **Overseer** of cuff knitting, who thoroughly understands fixing Tiffany and Cooper machines, wishes position. 45 years of age; English; married. Good references.

2050 **Foreman** of Knitting room. Age 43; American; married. One girl a looper in family. Cotton, wool, worsted, mercerized, lisle and silk hosiery or the same in underwear. Excellent references.

2036 Open to take the management and superintendency of a rib mill in one of the Southern States. Has had a large experience as a manager and the fitting up of mills. Can give the best of references as to ability, sobriety and character. Is familiar with all kinds of ribbed goods. 35 years of age; American; married.

2042 **Manager** or superintendent of a hosiery mill is looking for a position. Age 40; American; married. Has had over 10 years' practical experience in the full fashioned hosiery manufacturing business in all its branches. Feels competent to build up and successfully manage an up-to-date mill. Will put in some money if enough inducements.

2038 **Machine Fixer** or foreman is open to a position. Age 23; American. Will go anywhere, but prefers southern States. Silk and cotton half hose, misses' ribbed and ladies' hosiery. Is familiar with Standard B, Brinton, Branson, Scott & Williams knitters, also embroidery machines and several makes of sewing machines.

2026 **Fixer** and machinist on Leighton circular sweater and jacket machines. 15 years' experience. Age 35; American; married. Will consider nothing less than $15 per week. Good references.

2072 **Foreman or Fixer** would like a position in or near Philadelphia. Eight years' experience on ribbs and footers. Familiar with Acme, Excelsior, Branson and several other makes, also loopers.

2056 **Machine Fixer** or foreman. Age 25; German; unmarried. Is familiar with Boss, Standard, Invincible, new Victor, Excelsior, Brinton, Branson, Scott & Williams, Paxton & O'Neill and all kinds of rib machinery.

2047 **Factory Manager** in a cotton hosiery mill. Prefers to be located in the middle South, but will go anywhere. Experience large and varied. Cotton and worsted hosiery of all grades.

2007 **Supt. or Mill Manager.** Age 27; single. Is practical in any department. Able to adjust loopers, ribbers, etc. From shipping clerk has had charge in turn, pressing and drying, looping, paring and packing departments. Has hired labor, made up new lines and bought some of the stock. Is familiar with office work.

2018 **Foreman** or fixer of a knitting mill making golf goods, sweaters, cardigan jackets, caps, petticoats and other kindred goods. Age 31; German; married

DESIGNERS.

1996 **Designer or Assistant Superintendent** desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable.

1997 **A Young Man**, 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family.

2044 **Designer** in cotton or mixed goods is open to a position. Age 24; English; married. Almost all kinds of cotton goods, leno and lappet effects, colored work and weaves of all kinds from 2 harnesses up to and including jacquard work. Wants $3 50 to $4 per day to start.

1962 **Designer,** boss weaver, or both, desires a position in a woolen or worsted mill. Is at present employed as designer and boss weaver on worsted and woolen dress goods and suitings, and giving satisfaction. 30 years old; Swede; married. Expects moderate salary. Will go to any part of the United States. References from well-known textile men.

1923 **Assistant Designer** on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references.

FINISHERS.

2004 **A Boss Finisher** of over 25 years' experience on fancy cassimeres, worsteds, dress goods, serges and a large variety of steam finished goods, beavers, kerseys, cloakings, meltons, cheviots, etc., is open to a position. 44 years old; American; married. Good references. Moderate terms.

2070 **Overseer of Finishing**, age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc.

2068 **Bleacher.** Thoroughly understands the bleaching and finishing of all classes of linen and damasks, also all classes of cottons, plain and fancy, heavy Marseilles and satin quilts. Well up to date. 20 years' experience in Ireland and England as overseer, also five years' in this country. Good references.

1870 **Foreman of Finishing** room, folding, packing, etc. Age 49; married; American. Has had over 12 years' experience as foreman on white goods in one of the largest bleacheries in the country. First-class manager of help and capable of getting good results.

2061 **Boss Finisher.** Would take good secondhand or wet finishing job. Age 41; English. All kinds of woolen and worsted goods, both steam and dry finish. Willing to go anywhere. Both English and American makes of machinery. Excellent references.

1990 **A Foreman** in Finishing room on all kinds of cotton piece goods. Accustomed to all kinds of folding, packing, etc., and machinery used therein. English, married, age 36. Five years in last situation. Has been in this country 12 years. Can give references from present and past employers.

DYERS.

1972 **Boss Dyer** of large experience on cotton, cotton and wool, shoddy waste, camel hair raw stocks; all wool flannels, ladies' dress goods, worsteds, friezes and Union piece dyes; and skein dyeing, hosiery, etc., is open to a position in a woolen, worsted or hosiery mill. 50 years of age, English (naturalized), married. Best of references. Terms moderate.

1995 **Boss Dyer** who has been 12 years in a large Connecticut woolen mill is open to a position with any good concern. 40 years old; American; married. Piece dyes, yarns, mohair, wool stock, indigo vat-, fancy shoddies and raw cotton. 17 years' experience. Good references. Terms moderate.

1979 **A Boss Dyer**, who has been assistant dyer in one of the largest mills in the United States for the last ten years, is desirous of making a change. Is familiar with wool slubbing, worsted yarn, and pieces; cotton raw stock, skein and warp yarn, pieces, and also Union goods. Understands all modern dyeing machinery. Best of references. Salary moderate.

1966 **A Color Mixer,** chemist or cotton piece dyer is open to a position English; 30 years old; married. Was assistant manager of large print works in England for three years, and can refer to well-known men. Terms moderate.

2013 **Superintendent** of dyeing and finishing, or assistant manager of a woolen mill where dyeing and finishing is done. Can design. Age 41; English; unmarried. Worked on all classes of woolen and worsted goods, cotton linings, cotton velvets and plushes. To secure permanent position is willing to start for small salary.

2065 **First-Class Dyer,** Bleacher and Mercerizer is open to a position Had a lifelong experience on cotton yarns unions, merino, hosiery, underwear, tapes and braids. Would like to get a position in a dyehouse just starting, if possible. Is competent of erecting and equipping a modern dye plant.

2064 **Overseer of Dyeing** and finishing. Has worked on all kinds of piece dyeing, both cotton and wool, and all kinds of raw stock, dress goods, blankets and fancy cassimeres. Is familiar with Curtis & Marble, Parks & Woolson and Hunter fulling mills. Good references.

1978 Position wanted as assistant in laboratory or dye house by young man (21). Has had course in chemistry and dyeing Experience in dye house of large cotton and woolen mill, also in dyestuff laboratory. Best of references. Start for $12 per week.

2037 **Dyer** of any kind of carpet or rug yarns is open to a position. Been with one firm a number of years.

1954 **Dyer and Bleacher** of fast, common and one dip colors on cotton warps and skein yarns, is open to a position. Scotch Irish; married; 38 years of age. Excellent references.

1908 **Boss Dyer and Bleacher.** Age 23; American; single Now employed, but will change for good job. Best of references from present employers.

1948 A young man, age 21, American; single; now employed in a dye house of a knitting mill, would take a position as second hand in a dye house of some large mill. Has had experience in the dyeing and bleaching of cotton and union knit goods, and also has had two years' experience in an aniline laboratory.

MISCELLANEOUS.

1826 **Wanted** by steady, industrious man (English) a situation as overseer in tape mill. Would prefer starting up a new place. Wife can take charge of spooling and warping. Both hustlers. Wages according to merit. Would go anywhere and settle.

1803 **Roll Coverer.** I have done the work for a number of the largest cotton and worsted mills in this country, and am well known throughout the trade. Have been in the business 35 years, and can furnish stock and tools. Would be glad to take piece work, if shop is furnished, or would take a place by the day. Can furnish best of references.

2025 **Master Mechanic** wishes position in the North. 35 years old; married. Worked 15 years on repairs. Wants $3 50 per day. Has license for running engines and boilers. Understands all kinds of water wheels and care of same, dynamos and electric lights and also gas houses, and a good knowledge of building, all kinds of wood work and piping and blacksmithing Understands cotton mill repairs as good as thebest man at such work.

2029 **Overseer of Spooling,** warping, Twisting, reeling, coning in large mill, or spinning added to above in a 12,000 to 15 000 spindle mill, is open to a position. Age 31; Canadian; married. Excellent references.

2030 **Loom Fixer.** Age 43; American. Is familiar with Crompton & Knowles, Davis & Furber, either broad or narrow. Gilbert and Lewiston looms.

2045 **Colorist** and color mixer for all kinds of printing. Also understands plush printing and extract work. 10 years' experience. Can give references.

1980 **An Expert** on soap making and wool scouring will be open to a position shortly. Is familiar with the treatment of all grades. About 40 years old. English; married. Has worked for one concern in the United States for 12 years.

2071 **Foreman** or sewing machine repair man, age 32; American; married, is open to a position. Experience in drying, napoing, trimming, finishing and dressing of flat goods, also care of help and machines. Is familiar with Singer, Union Special, Willcox & Gibbs, Wheeler & Wilson, National and Union machines. Men's, ladies' and children's flat goods, fleece lined.

1905 **Sewing Machine Fixer** and machinist, age 25 years, is open to a position. Worked eight years at the business, and can take charge of all kinds of sewing machines and keep them in repair, used in finishing underwear, overalls, men's shirts, skirts, waists, wrappers, handkerchiefs, etc.

2068 **Assistant Supt.** Chief or Mechanical Engineer. Age 38. Technical graduate. 15 years' practical experience in cotton and flax mill repairs and equipment, well acquainted with cotton, flax, tow and jute machinery, and detail construction of same, also with the installation of power plants and power transmission. Would make a first-class mechanical superintendent. Best of references. Prefers New England.

What the I. C. S. did for Me.

Four years ago I was overseer of a weaving department and would still be, had I not enrolled in your Complete Cotton Course. But as a result of my training by mail, I have been promoted to the position of superintendent, with a large increase in my salary. I owe all to the training received through the Schools. JOHN G. KING, Burlington, N. C.

We have hundreds of endorsements just as strong and convincing as the foregoing. We can train YOU for a better position and a better salary. We have been doing this for others for over ten years. It will cost you but a two-cent stamp to investigate. Cut out, fill in, and send us the coupon. You will receive letters of successful students, and our valuable advice by return mail.

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Box 860, Scranton, Pa.

Please explain how I can qualify for position marked X below.

Cotton Mill Supt.	Electrical Engineer
Boss Cot'n Carder	Electrician
Boss Cot'n Spinner	Steam Engineer
Boss Cot'n Weaver	Marine Engineer
Woolen Mill Supt.	Civil Engineer
Boss Woolen Carder	Surveyor
Boss Woolen Weaver	Architect
Woolen Designer	Chemist
Cotton Designer	Bookkeeper
Mech. Engineer	Stenographer
Mech. Draftsman	To Speak French
Machine Designer	To Speak German
Foreman Machinist	To Speak Spanish

Name _____

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City _____ State _____

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462 Pages. **22 Textile Maps.**

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Textile Establishments of the United States, arranged by states and towns where they are located, with full data about each mill, also maps of the manufacturing states showing towns where there are mills. Textile Establishments of the Dominion of Canada, with map of Ontario and Quebec. Alphabetical Index of all the mills in the United States. Mills with Worsted Machinery. Number Spindles and Looms in the United States.

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Part IV. Dealers in Raw Material and Stock.

Wool and Shoddy Dealers and Brokers. Cotton Dealers and Brokers. Wholesale Rag Dealers.

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GUILD & LORD, Publishers.

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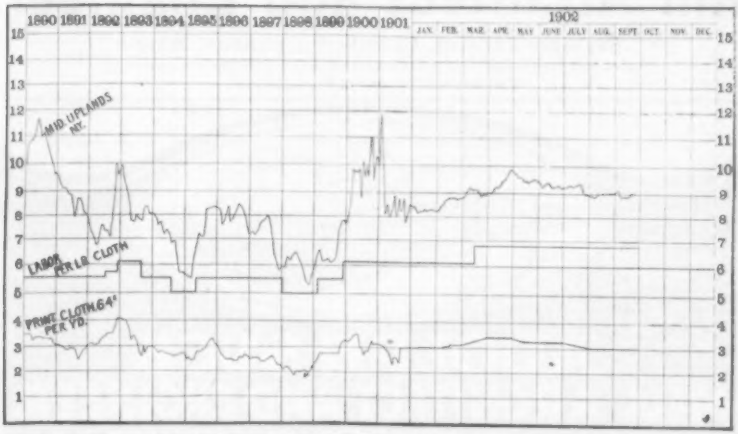
1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901
1902
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
MID. UPLANDS N.Y.
LA30S PER LB. CLOTH
PRINT CLOTH 64" PER YD.

GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Neither speculative nor natural causes have disturbed the cotton market during the past month. The reports as to new cotton have been conflicting, as they always are, but the fact seems to be that the conditions have been favorable for gathering the crop.

Domestic spinners have been free purchasers, and the movement from Southern points has been large. The export business has been of good volume, and quotations have remained steady. Spinners, both here and abroad, have reached a position where purchases were unavoidable, and their operations, while tending to strengthen prices, were offset by the tight money market that forced many speculative holders to unload.

The world's visible supply Sept. 26th was estimated by the Chronicle at 1,755,848 bales, as compared with 1,474,825 bales on the same date in 1901, 1,405,161 bales in 1900, and 2,899,671 bales in 1899.

The reports from the Egyptian crop are favorable. The market has been strong, and in many cases the high prices asked by holders have restricted business.

The Liverpool Cotton Association inaugurated important reforms on Oct. 1st in the sale of American cotton, by the following resolution:

1. That the discount of 1 1/2 per cent. be abolished.

2. That the allowance for tare and draft be 4 lbs. per 100 lbs., 2 lbs. of which to be considered draft. Draft actual as at present.

3. That the weights in contracts for future delivery be changed from 47,200 lbs. to 48,000 lbs.

4. That these alterations come into effect on the 1st of October next, contemporary with the change in quotations to be 100ths, instead of 64ths of a penny, when every point on a 100 bales contract will express two pounds sterling.

Telephone Connection.

KROUT & FITE MFG. CO.,

Manufacturers of

SILK and COTTON NARROW FABRICS

Spool Tapes a Specialty.

Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

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BINDINGS.

Medium and Superfine Tapes a Specialty.

2046 Amber St., Philadelphia.

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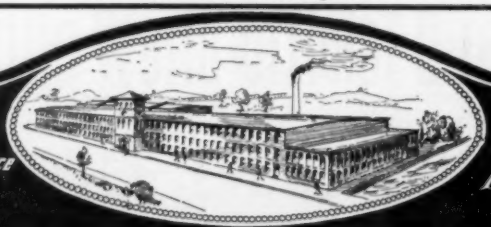
Mill Architect and Engineer,

Exchange Building, 53 State St., BOSTON, MASS.

Plans and Equipment of Cotton and other Textile Mills a specialty.

Valuation of Mill Properties



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MILL ARCHITECT AND ENGINEER

179 SUMMER ST. BOSTON MASS. U.S.A.

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TEXTILE MILLS
MANUFACTURING PLANTS
AND OFFICE BUILDINGS
POWER PLANTS
COAL MACHINERY
COAL BUILDINGS

PLANS, SPECIFICATIONS, DETAILS AND SUPERINTENDENCE FOR CONSTRUCTION, EQUIPMENT AND ORGANIZATION OF COTTON, WOOLEN, WORSTED, SILK AND OTHER TEXTILE MILLS

INDUSTRIAL PLANTS OF ALL KINDS DESIGNED TO MEET THE REQUIREMENTS OF MANUFACTURERS.

ORGANIZATION AND EXTENSION OF OLD PLANTS.

SAMUEL M. GREEN,

Consulting and Supervising Engineer for the

RECONSTRUCTION OF POWER PLANTS

And General Textile Mill Construction,

HOLYOKE, MASS.

JOHN W. FERGUSON,

Builder and General Contractor.

MILL BUILDING A SPECIALTY. References made to some of the largest mill owners in the Middle States, including Clark Thread Co., Newark, N. J., Barbour Flax Spinning Co., Paterson, N. J., and others.

253 Broadway, New York. *90 Washington St., Paterson, N. J.*

YARNS

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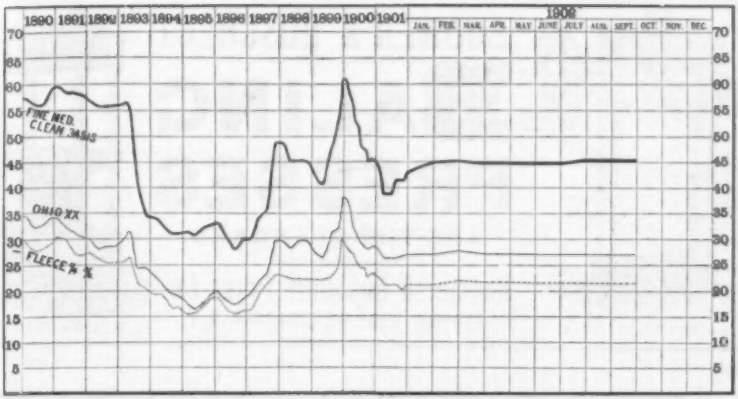


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The last month has witnessed a quiet and steady market in wool, and no changes in quotations are to be recorded.

The mills are busy and consuming large quantities of wool, mostly of the new clip, as old wool has been pretty well cleaned up. Two tendencies are in evidence: First, the statistical position of the staple which tends to put prices up; second, the disposition of owners of wool to sell at the market, which serves to keep prices at the present level. The trade has not forgotten the bitter experience following the wild speculation of four years ago, and are ready to take a small profit rather than play for a large one and get a loss.

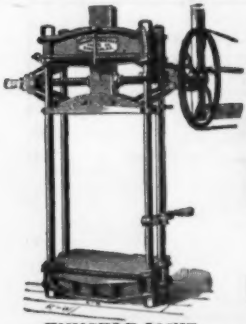
The mills have their orders well covered with raw material, and this makes the present a between seasons period, in which the demand is largely made up with orders to "fill out."

The trade in foreign wool is dull as the stock is low in spite of the heavy importations of the past year. The London market is somewhat stronger, but the advance reported at the opening of the last sale has not been maintained.

Bindings, Webs etc.
Spool Tapes and Stay Bindings.
HAMILTON MILLS.
J. H. HAMILTON & CO. 84 FRANKLIN ST., NEW YORK.

CROCHET LACE EDGINGS
TAPES—BRAIDS—THREADS
DOMETS—CAMBRICS—SILESIAS
GEORGE W. CHAPIN,
YARNS Successors to FLEMING & CHAPIN.
229—CHURCH ST.—231 PHILA.

WM. M. YOUNG,
Manufacturers of
Worsted Spindle Tapes, Cotton Mule Banding, Hook Bands and Hooks of Every Description. Single and Double Loop Bands for Mule and Cotton Spinning Frames.
Office and Factory: 2421-23 MASCHER STREET,
Factories: 3638-40 Frankford Ave. 3681-33-35-37-39 Emerald St.
PHILADELPHIA, PA



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ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

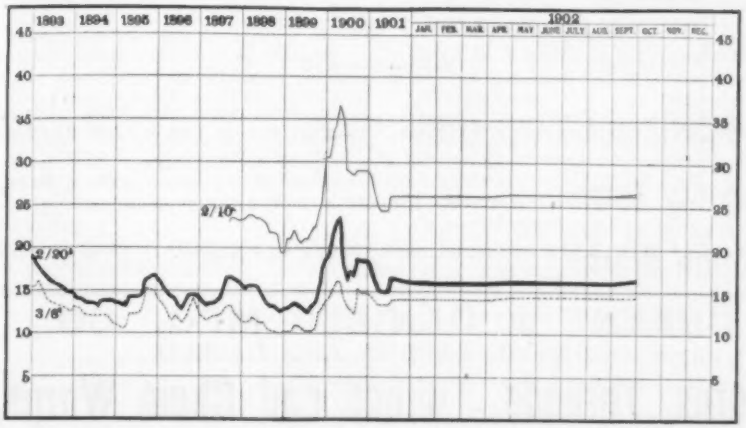
TO SPOOL FROM COP, SKEIN, OR BOBBIN.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, Philadelphia, Pa.

YARN DEPARTMENT.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn Market.

It is very gratifying to be able to record an improvement in this market. A distinct advance has occurred during the past month, shared in by both fine and coarse grades. The strength of the raw cotton market and the brisk demand for both woven and knitted cotton fabrics, together with the reduced production of yarn for several months, have had a decided effect on prices. The advance that has been made does not by any means give the spinner sufficient margin. In many grades, cotton yarn is still selling below the cost of production based on present prices for the raw material. Weavers and knitters have placed orders freely during the past few weeks to cover orders for goods, and in some cases have made contracts considerably beyond their immediate requirements. We quote as follows:

Cops.

6s	14¾
8s	15
10s	15¼
14s	16¼
16s	17
22s	18½
24s	18½
26s	20¼
30s	21¼
34s	24¼
36s	25¼
40s	27¼

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carder Peeler.

12s	16½
14s	17
18s	18
20s	18½
22s	19
26s	20
28s	20½
30s	21
36s	22½
40s	23-24
45s	27
50s	31
55s	34
60s	39-40

Eastern Two-Ply Warps, Carder Peeler.

2/30s	20-21
2/36s	22-23
2/40s	24-25
2/45s	28-29
2/50s	32-33
2/60s	41-42

Egyptian Weaving Yarns.

Single Skeins Combed.

30s	32-33
35s	35
40s	37
45s	39
50s	42
55s	45
60s	50
70s	59
80s	70
90s	73-74

Two and Three Ply Skeins, Combed.

30s	36-37
36s	38-39
40s	39-40
45s	41-42
50s	45-46
55s	48-49
60s	50-51
65s	55-56

Philadelphia Yarn Market.

The sharp advance in cotton and the fact that a large number of mills were shut down, or running on short time during August, has had a good effect on the yarn market.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

Cotton Warps

HOUSATONIC, MASS. 4s to 60s.

OIL SEEDS PRESSING COMPANY,

Manufacturers and Importers of

VEGETABLE OILS.

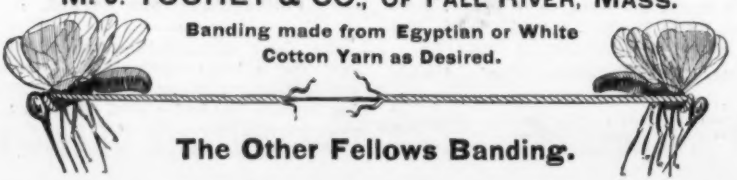
15 to 25 Whitehall Street, - - New York.

BALLOU YARN COMPANY, PROVIDENCE, R. I.

GASSED YARN, Harness and Seine Twines and other Job Gassing, Winding, &c. All Numbers. SPECIALTIES

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

Prices on all lines have advanced. There is considerable confidence in the market and spinners are holding for still higher prices than can be obtained today. Cotton is very scarce at the spinning point, and prices are ruling so high, that an advance in yarn is positively necessary to spinners. Some large contracts have been placed, but most spinners are selling conservatively and waiting further developments in the cotton situation.

Egyptian yarns have been in good demand and prices are firm. We quote as follows:

7s and coarser	14-14½
8s and 9s	14½-14¾

Southern frame cones (good quality):—

10s	14½-15
12s	15-15¼
14s	15¾-16
16s	16-16¼
18s	16½
20s	17
22s	17½
24s	18
26s	18-18½
30s	19
40s	25
50s	31

Southern high grade mule yarn:—

Cones.

10s	15½-16
12s	16-16½
14s	16½-17
16s	17-17½
18s	17½-18
20s and 22s	18-19
24s	19½

Southern frame yarn, lower grades:—

6s and 8s	14
10s	14½

Eastern cones (high grade quality):—

10s	16
12s	16½
14s	17
16s	17½
18s	18
20s and 22s	18½-19

Lower grades Eastern yarn:—

6s and 8s	14½
10s	15

Rise 1/4c. per number to 16s.

Besides this there is some comber waste used, that is made into 8s and 10s cones and sold at 14½ to 15.

Skein yarn (mostly Southern):—

4s to 6s soft	14-14¼
10s to 12s	14½
14s to 20s	15-15½
22s	16
14/2	14¼-14½

RICHARD A. BLYTHE,
Commission Merchant,
Cotton Yarns of every description.
114 Chestnut Street, - PHILADELPHIA.

Buckingham, Paulson & Co.,
COMMISSION MERCHANTS.
COTTON YARNS of all Descriptions.
83 Leonard St., New York.
120 Chestnut Street, Phila. 530 5th Ave., Chicago. Ills
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL & CO.,
COMMISSION MERCHANTS.
COTTON YARNS
FOR ALL PURPOSES.
122-124 Chestnut St., PHILADELPHIA, PA.
Brown Building 185 Summer St., BOSTON, MASS.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

J. S. DODDS,
346 Broadway, N. Y. Life Bl'd'g., New York, N.Y

MERCERIZED YARNS
Two and Three Ply, for All Purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.
Through H. A. CAESAR & CO.

A. D. SALKELD & BRO.
With
FRED'K VIETOR & ACHELIS.
YARNS,
66-72 LEONARD ST., NEW YORK.

MOELLER & LITTAUER,
IMPORTERS AND MANUFACTURERS OF
Silk, Worsted, Woolen, Cotton & Mohair Yarns and Tinsel. Chardonnet Artificial Silk.
Mercerized, Turkey-Red, Swiss Emb. Yarns.
109 Green St. NEW YORK.

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WORSTED AND WOOLEN YARNS,
MERCERIZED COTTON,
395 Broadway, New York.
Tel. 1828 Franklin.

Eddy & Street,
COTTON, **YARNS** WORSTED,
WOOLEN, AND **BRAIDS** SPUN SILK.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles.

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FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

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The "Drosophore" and "Vortex" Humidifiers.

Over 20,000 of our HUMIDIFIERS in operation.

Highest award on the Recommendation of The FRANKLIN INSTITUTE for

"SIMPLICITY and ORIGINALITY of DESIGN"

DANA WARP MILLS

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WHITE AND COLORED WARPS,

6s to 50s—Single and Ply.

MULE COPS,

from 30s to 50s from

AMERICAN AND EGYPTIAN COTTON.

Indian Orchard Company

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool. Machined or in Roving.

Indian Orchard, Mass.

F. MORGAN PEIRCE H B WRIGHT, TREAS. W. C. GODFREY, AGT.

16/2	14½-15
20/2	15½-16
30/2	17½-18
40/2	23
16/3 slack	15-15½
12/3 slack	14½
8/3 carpet	14-14½

Skein yarn (mostly Southern):—

8/3 slack	14
9/4 slack	14

Warps (mostly Southern):—

14s to 16s	14½-15
20s and 22s	15-16
26s	16½
14/2	15
16/2	15-15½
20/2	16
24/2	17
30/2	18
40/2	23-24

Mixed colored yarns (mock twist, half colors):—

6s to 10s	16-16½
12s to 14s	17-17½
16s to 18s	18-18½

Silver and jaeger, 1½ to 2c. over white.

Mock Egyptian, 3c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Worsted yarn spinners' orders are running out and they are in consequence making great efforts to secure orders with which to run their mills. The advance in the price of yarn, which has caused a material advance in the cost of worsted cloth, has brought about this check in the production of yarns.

The mills which have secured the bulk of the business so far are those which are running on yarns from ½ Blood and ¼ Blood. The advance on the finer grades has been so great that the cloth buyers refuse to buy fabrics made from these yarns.

The production from lower grades of yarn are also falling off and bnyers generally are placing orders for cloth made on wool spun machinery and these woolen mills are largely substituting shoddy and nolls for wool. In some instances, however, the buyers of worsted cloth have held off from buying and weavers of cloth have held off from placing orders for yarn.

At the present writing some of the weavers are receiving orders for cloth for immediate delivery and so great is the "rush" for the yarn to produce this

WILLIAM B. CHARLES,
Cotton Yarns, Cotton Cloth, Silesia, Sateens
for the Underwear Trade.
Amsterdam, - N. Y.

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
906 Chestnut St., Philadelphia.

Walcott & Campbell Spinning Co.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., - N. Y.

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above. AND
FITCHBURG, MASS. WARPS

COTTON, WORSTED, WOOLEN, MERINO AND FRENCH SPUN YARNS
Mercerized Cotton a Specialty
Write for Samples.
E. A. MORGAN & CO.,
54-56 Franklin St., N. Y. City.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Mercerized, Turkey Red, Gassed } Cotton Yarns.
Jacquard and Harness Twines.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.
Philadelphia.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
987 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co.,
MANFRS. OF
ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,
Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

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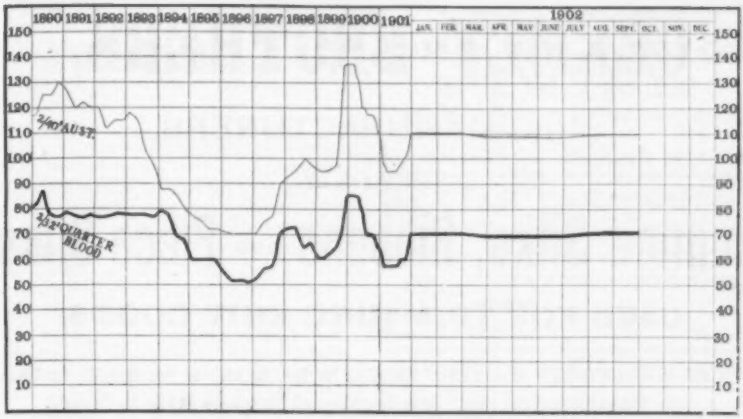

CHART SHOWING RANGES OF PRICE OF WORSTED YARN.

cloth that weavers are forced to have the spinners forward large yarn orders by express. While weavers in some instances are without contracts for worsted yarn, yet undoubtedly a demand for such yarn may be expected at any time. Although weavers realize this, yet even with the present advance of yarns they are unwilling to place orders at even the old contract prices, and when salesmen approach these mills for business they state that they are not ready to place orders until the situation has been fully developed for them.

Some of the worsted mills undoubtedly have received a fair amount of orders, but this is the exception rather than the rule, and the effect of this has been that when old contracts are run out they have not been renewed by the weavers.

Some of the weavers when they have placed orders at the advance have done so with the feeling that the spinner has taken advantage of them. They either cannot or will not concede the fact that wool has forced spinners to advance prices to the present advance. Some spinners anticipating a further advance

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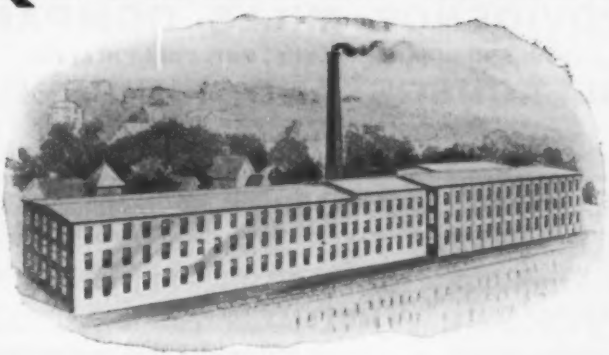

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Dyeing facilities are new and best quality work guaranteed.
We are prepared to dye yarns for other parties.

WHITTIER MILLS, Selling Office, Springfield, Mass.
Mill, Chattahoochee, Ga.

refuse to give prices for future delivery. Although spinners maintain a bold claim as to the amount of business secured, yet they are all working like beavers to secure orders.

The weavers of bunting during the summer were slack and short of orders, but since the early part of September, trade has revived and while they are not rushed and could take more orders, they are now well employed, although selling at old prices. Many of these mills have yarn bought to carry them and are not now worrying over the advance price of yarn.

The season on heavy weight dress goods has been a good one, and much yarn has been used in 2/36s 1/4 Blood and below. The light weight season opens up about October 1st. Much novelty yarn will be used in the coming season in nub effects and a good season is anticipated.

Many of the French system spinning mills are running on men's wear yarn making fancy effects and also single yarn for clay worsted and also undressed worsted orders are coming forward from this source.

The knitters, both on hosiery and knit goods, are not using much all wool French spun worsted yarn, although a good business is doing for percentage yarn having all the way from 20 to 80 per cent. cotton. We note in this connection that there is a new competitive factor against French spun yarn. Some cotton spinners are making worsted yarn out of a percentage of wool. Those spinners having cotton combers are running wool in with their cotton and are producing a yarn which is salable and from which good results have been secured. The yarn is not so even as regular French spun yarn, yet it answers the demand for cheaper yarn and is giving good results. The stockinett knitters are well employed, as are the knitters of jerseys for the rubber trade.

Woolen Yarn.

Spinners continue busy on old contracts and the prospects are good for future business, although but little new business is being secured. The coming men's wear season is calling for cloth made out of woolen yarn, and later many orders will be placed to take care of the trade; at the present time the light weights are being made with woolen yarn filling and worsted warp, and spinners are securing some business.

The coming heavy weights will require the woolen spun yarn filling and also the backing. It is undoubtedly a fact that the mills making woolen spun yarn cloth are getting most of the present

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business, and these mills are making their yarn out of shoddy and noils instead of straight wool. Said one manufacturer, We are going to use noils in a place we have never before used them in order to meet the present condition of the market.

Some mills which before have used shoddy and wool are now using shoddy and noils. The knitters of the finer class of underwear are having a better demand for garments, but are short of all kinds of material.

The hosiery manufacturers are placing orders for all wool yarn cautiously, and are inclined to buy only on the market in small lots. In some quarters the manufacturers of medium grade flat underwear are very much discouraged. One manufacturer is going out of business. In this instance the mills turned from fine goods to medium and cheap goods and have lost their business in consequence. The felt business is good and the manufacturers are buying large quantities of noils. Yarns are firmly maintained on account of high prices of wool.

The Rag and Shoddy Market.

This market has remained in practically the same condition as at our last report. There has been a fair volume of business, but it has not been large enough to advance prices.

Shoddy men are unable to pay the prices asked by the rag dealer, as the mills strenuously resist a corresponding advance. The manufacturer of goods is doing a good business and the price of wool is firmly maintained, two things that serve to strengthen the rag and shoddy market. On the other hand competition in the goods market is keen and manufacturers see no way in which to pay higher prices for raw material and retain the present margin on goods.

Softs are selling well, the fine stock being most in request. The relatively higher prices that have prevailed for this stock have brought out a liberal supply with a corresponding recession in values. Black worsted stock is scarce and meets with a ready sale when offered. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Merino.	
Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	17-18
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17
Regular gray	12-13
Black	14-15
Fancy colors	16-20

WOOLEN RAGS.

Fine merchant tailors, all colors	10½-12
Choice light colors	13-15
Browns	12-13

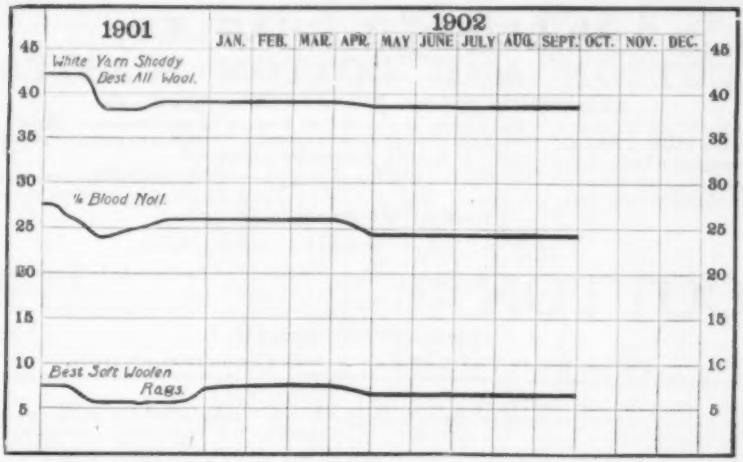

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Blacks	9½-10½
Fine blues, plain	11-12
Fine dark	10-11
Medium dark	7-8
Worsteds.	
Blue	16-18
Black	21-23
Serges.	
New blue	16-17
New black	15-16
Flannels.	
New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	6-6½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Old plaids	5-7
White stockings	18-20
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	8-9
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14
Merinos.	
Light, fine	14-15
Light, coarse	7-8
Fine dark	10½-12
Dark, No. 2	5-6½
Coarse dark	4-4¼
Blue	10-11
Blue—seamed	14-15
Black—unseamed	10½-11½
New black	18-20
Small	3¼-4
Bunting	6-8

NOILS.

Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅝ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½
Seedy.	
½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	8
No. 1 Machine	5-5½
No. 2 Machine	4½-5
Machine Cop	5½-6
No. 1 Cop	6
No. 1 Card	6½-7
No. 2 Card	4
No. 1 Oily Card	3-3½
No. 2, Oily Card	2-2½
Egyptian Card	7¼-7½
Peeler Combing	8¼-8½
Egyptian Combing	8-8¼
No. 1 Linters	3½-4½
No. 2 Linters	3-3½
White Clips	4-5
Colored Clips	2-2½
No. 1 Picker	1¾-2½

Trade and the Cinematograph.

According to a recent report of the Venezuelan Consul at Marseilles, the representatives of Brazil, the Argentine, and Uruguay at that French port have lately commenced a series of lectures on the resources of their respective countries, illustrating them with cinematograph views.

This novel way of familiarizing the public with the nationalities, town and country scenery, resources and trade, prospects for intending immigrants, etc., of foreign countries cannot fail to be of the greatest advantage to the latter, and this is fully borne out by the attention these lectures meet with on the part of

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Cotton Waste Purchased on Yearly Contract from Mills.

the Marseilles merchants, and also on that of the general public.—Commercial Intelligence.

Cotton Weaving in Lancashire.

A correspondent of the Cotton Factory Times, writing to that journal, says: It is evident that the Lancashire weaving industry is on the eve of an important change. The main point of this change, whether it will be for better or worse, depends entirely upon the way in which we prepare for it, but prepare for it we must. A similar experience befell the spinning trade when the old hand mules were rendered practically useless by the introduction of the self-acting mule.

In other branches of the trade improvements in machinery have also been the means of increasing the amount of production, as when the slasher sizing machine was introduced and displaced the slow but careful process of Scotch dressing; but, unfortunately, these improvements have often been the means of throwing some operatives out of employment.

There are about 90,000 automatic shuttling looms at work in America, and more are ordered. Yet the question is being asked in Lancashire—"Will the automatic loom work?" In numerous sheds a sample loom of one or other make is to be found, generally waiting for repair, if not already tried, sentenced, and condemned.

It is as practically impossible to obtain a favorable verdict for a single loom in a shed of looms of a totally different construction as it is for a pioneer missionary in a cannibal island. The difficulties in front of a trial loom are many, the tackler and weaver having to be taught afresh; and in the case of a labor-saving machine of this description the fear that if the loom is a success, and an order for more looms is given, some scores of weavers will be discharged, has a tendency to magnify faults and difficulties into insurmountable obstacles.

There are various reasons why the automatic shuttling loom has obtained such a hold in America, one of the principal being that inventors are better cared for in America than here. Northrop was an English mechanic, and is in a comfortable way now; whilst the inventor in England—and especially in Lancashire—is generally the loser by his ingenuity. The inventor of one of the most useful and necessary parts of the ordinary loom was rewarded with a gallon of beer, and other inventors have been even less fortunate. Another cause is the comparative difficulty of obtaining help, especially in those districts in which sheds were to be located.

One of the principal causes, however, is that the American manufacturer has the pick of the cotton, makes a stronger and hard warp yarn and weft, and is therefore enabled to weave for hours without a stop, whilst in Lancashire it is impossible for a weaver to tend more than four looms, even though the yarn is coated with twice its weight of animal, vegetable, mineral, and chemical substances.

If we are to have automatic looms we must have automatic everything else. A loom with a warp stop motion is worse than useless if it stops every inch or two of cloth, and a self-shuttling appliance in the case of pin cops, such as the writer has come across, would be an impossibility. We must have yarn and weft that will weave whether we have automatics or not. China drills, used so extensively for clothing in the East, and woven in America, have displaced those made in Lancashire, not because they are woven in automatic looms, but because they are made of cotton and not something else.

We must have more scientific management. A great number of our sheds in Lancashire are managed by fossils who would not be endured ten minutes anywhere else. Some owe their position to the money they have invested; some to their ability to make beautiful prayers in church or chapel; several to their interest in football clubs; and others the writer has known, are more celebrated for their knowledge of poultry or bee keeping, or even the making of pork-pies.

There is a great number of intelligent young men in Lancashire who are waiting their opportunity to manage mills; many have gone abroad, many are managing sheds in America, where these automatic looms are working, and if no chance is given them at home, many more will go abroad to assist the competition with Lancashire. The new weaving shed must be scientifically conducted; the weaver must spend more time in the actual supervision of his looms, and not be expected to have two or three looms stopped half a day whilst he is picking a cut, which, if proper yarn had been used, would not have required five minutes. Special persons should be appointed for this work.

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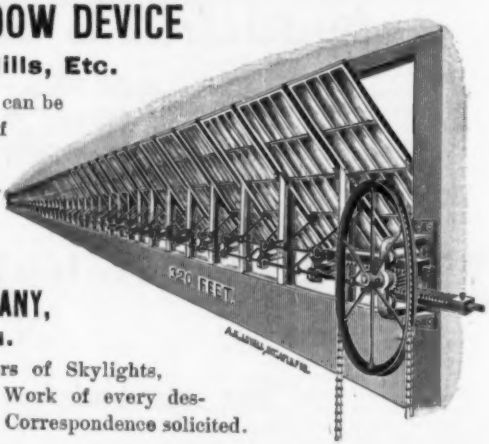

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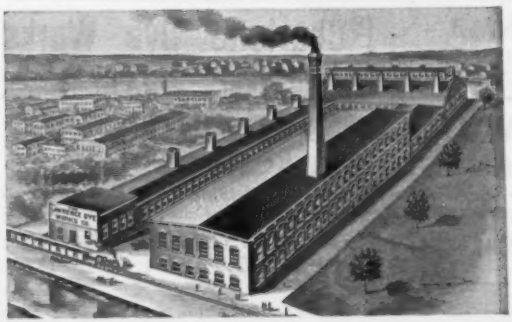

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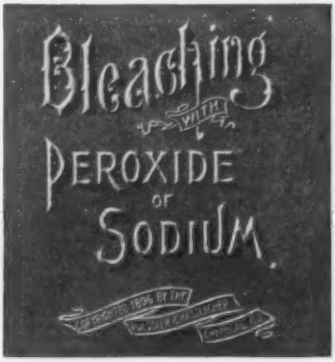

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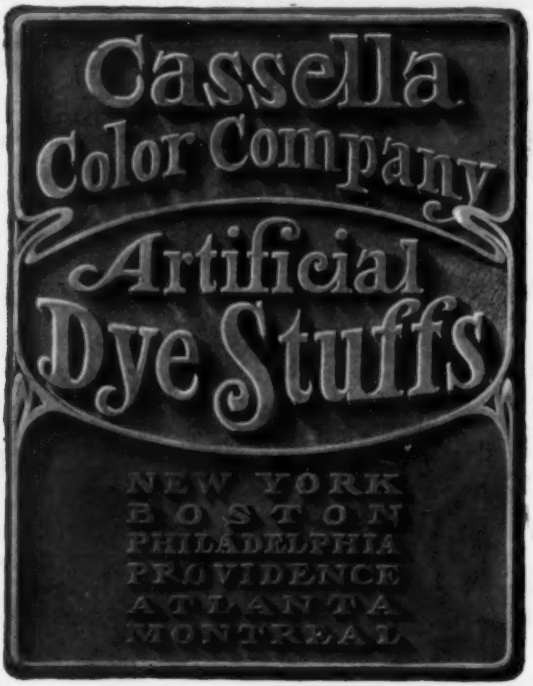

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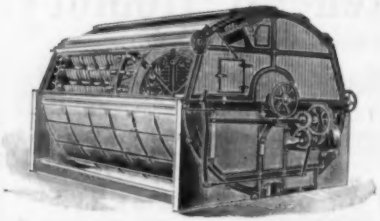

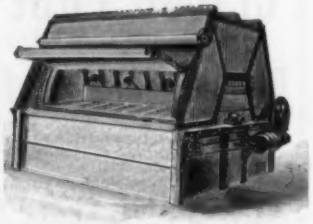

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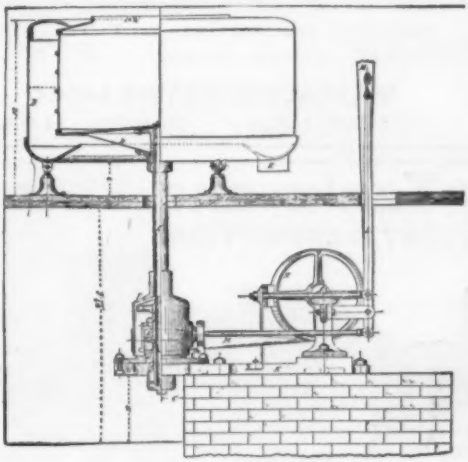

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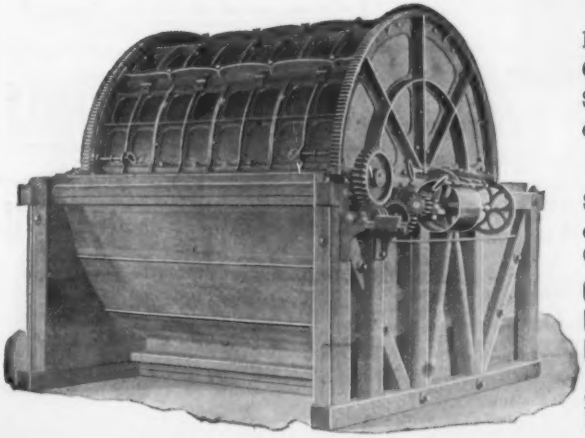

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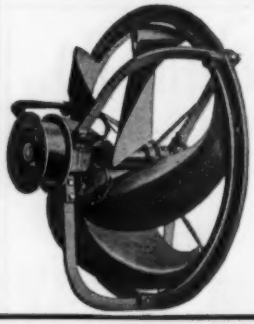

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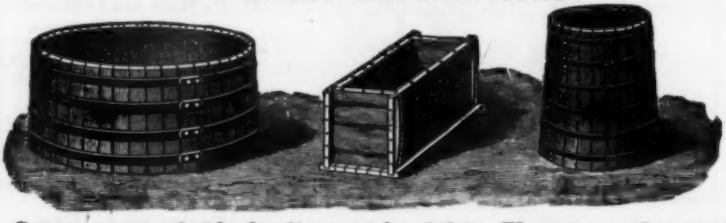

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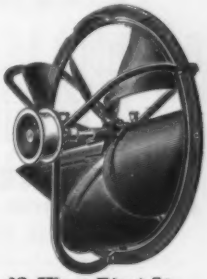

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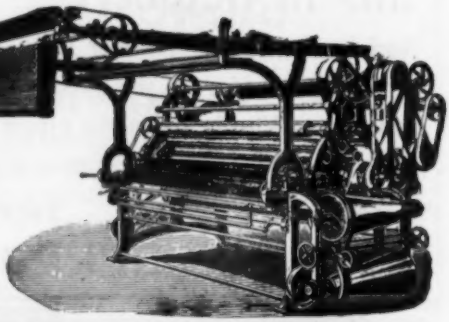

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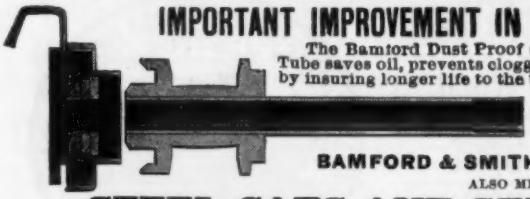

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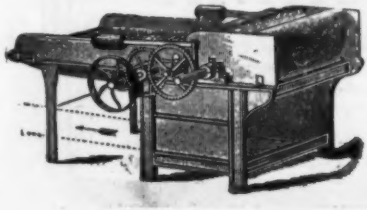

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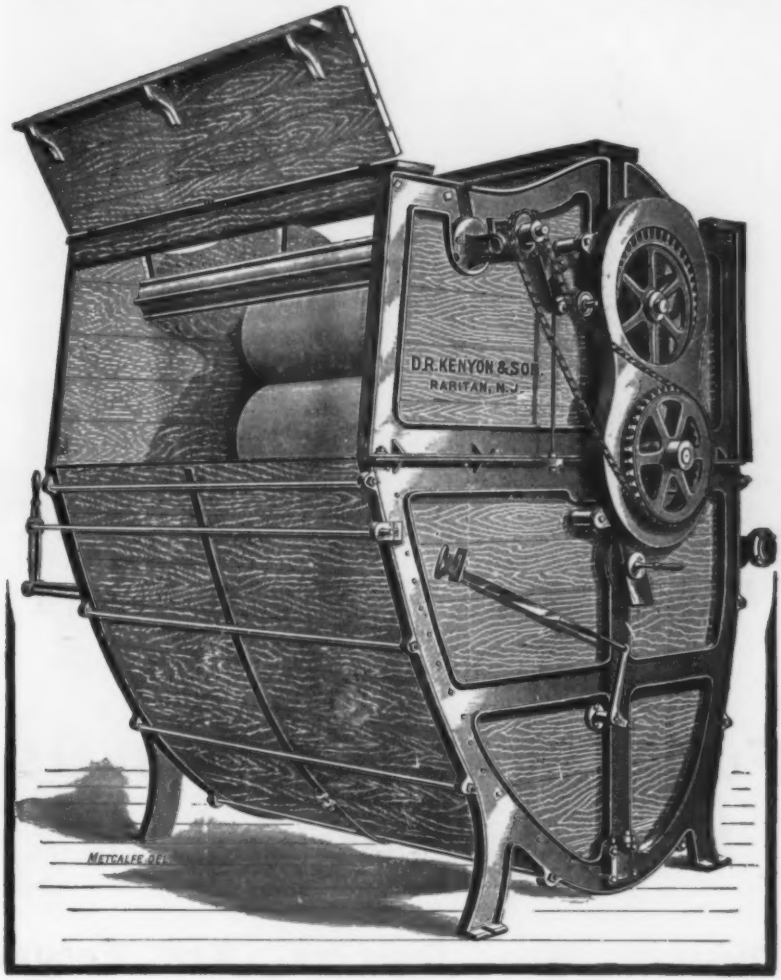

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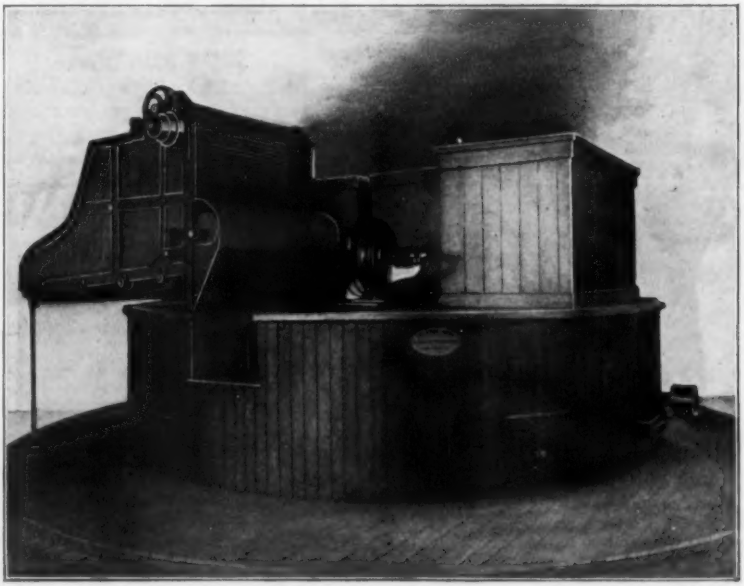

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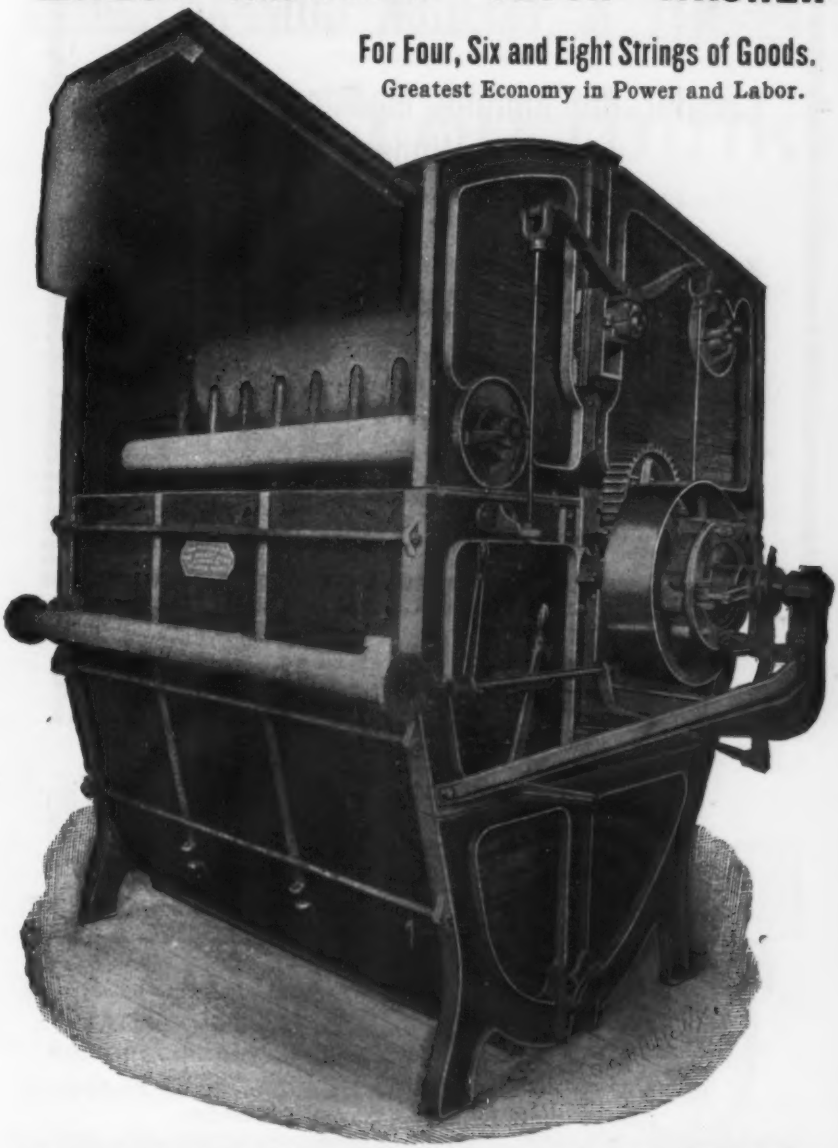

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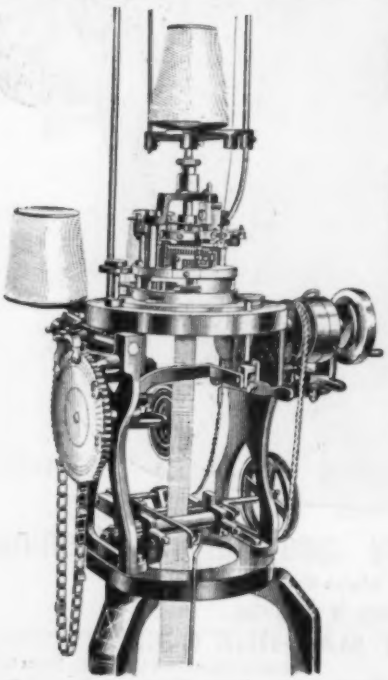

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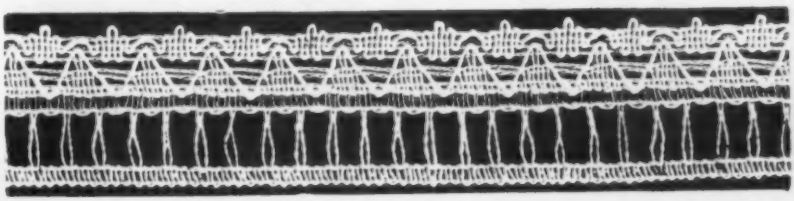

THE INVINCIBLE,

FULL AUTOMATIC KNITTING MACHINE

For SEAMLESS Hosiery

A BIG PRODUCER.

PRACTICAL AND ECONOMICAL IN OPERATION.

NO EXPERIENCE REQUIRED TO TRANSFER RIBBED TOPS BY THE INVINCIBLE METHOD.

A MACHINE OF THE HIGHEST GRADE.

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MANUFACTURED BY...

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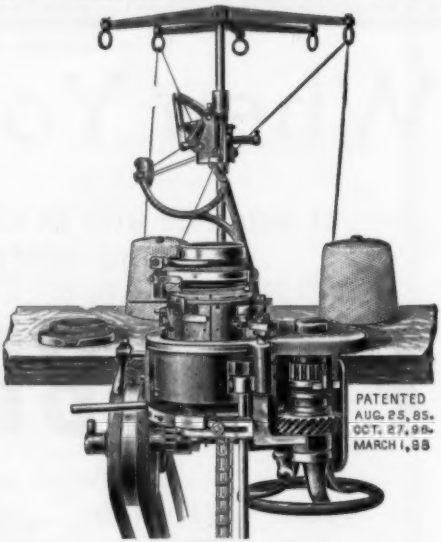
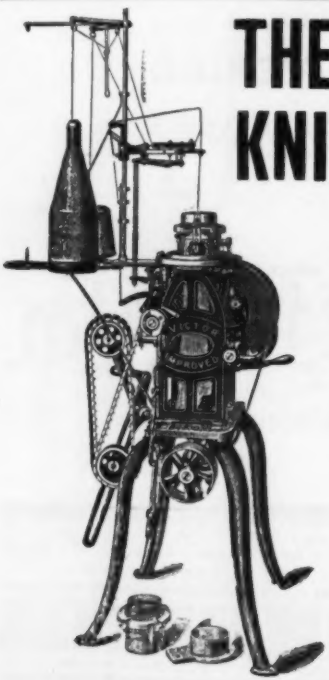


Factory and Main Office:
PAWTUCKET, R. I., U. S. A.
Branch Office, Room 370, Bourse Bldg., Phila., Pa



THE "NEW" VICTOR KNITTING MACHINE

A full Automatic Seamless Hosiery Machine. Thoroughly Interchangeable in all its parts. Automatic Two-color Striping Machine, also Black-Leg White-Foot Machine and Lace Machine.

American Knitting Machine Co.

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Southern Branch, Charlotte, North Carolina.
R. M. Oates, Representative.
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OF ALL KINDS. NEW AND SECOND HAND.

We are always in the market to buy good second hand Knitting and Finishing Machinery.

Before placing your orders, look carefully over this list and write us regarding the machines you need, or ask for catalogue and circular.

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CIRCULAR RIB KNITTING MACHINES,

Carefully designed and well made with Solid Forged Steel Cylinders and Dials, Segmental Cam Rings, Encased Take-up, Stop Motions, etc. Standard Sizes, Reasonable Prices. Also

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GAS ENGINES for city or country. | EFFICIENT
BRUSHING MACHINERY | DURABLE
KNITTING MACHINERY | LOW IN PRICE.

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SOLE MANUFACTURER OF THE
CHAMPION HOSIERY STAMP.
PATENTED JANUARY 7, 1896.
The only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics.
Blocks for Printing Hosiery.
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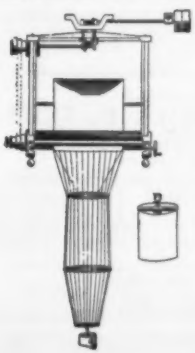

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Every mill that has tried my Improved Drying Machines for Knit Goods, claims it has no equal and the best Dryer made. More work; better work; less room at less expense.

That is the record that it stands by.

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Sole Owner and Manufacturer **E. M. ANTISDEL,**

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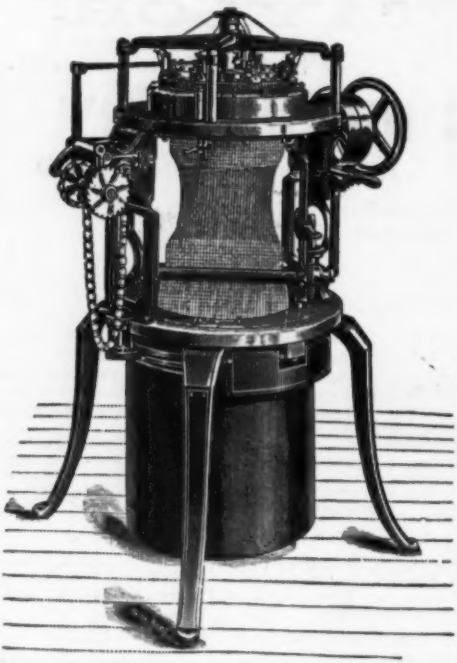

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AUTOMATIC AND PLAIN,

For all classes of Ribbed Hosiery and Underwear, Combination Suits Sweaters, etc.

ESTABLISHED REPUTATION FOR

Largest Production, Best Quality Fabric, Durability, Economy of Operation.

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LEADER OF KNITTERS

ORIGINAL and BEST
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Hosiery and Sweater
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SEAMLESS MILL BASKET,
M'f'd by CRANE BROS., Westfield, Mass.
Send for Price List.

CRANE MFG CO
LAKEPORT, N. H.
Spring Needle Circular Knitting Machine
For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.
A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

RILEY'S PATENT RIGGING CUTTING FOLDING MACHINES
For all kinds of Gray or Finished Stuffs, Woolens, Worsteds, etc.
CHAS. A. JOHNSON & CO. New York and Providence. } SOLE AMERICAN AGENTS.

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3-4 Automatic Knitter

FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers Range on Half Hose, from the coarsest to 220 needle.

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Cylinders and Dials for all size machines.

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506 N. American St., PHILADELPHIA, PA., **Pioneer Builders of**

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FOR SEAMLESS HOSIERY.

Estimates for Plants Complete.

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BANDS, BUTTON STAYS, FACINGS, Etc.,

can be made correctly only on the

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Automatic Band Folding and Cutting Machine.

ACCURACY, SPEED, DURABILITY.

THOS. KENNEDY, Cohoes, N. Y.

Our New Improved Light-Running Short Carriage

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unsurpassed for full-fashioned Sweaters, Jackets, Leggins, regular Knit Underwear, Union Suits, and all other *regular* and *selvage* Knit Garments. Made with 2 complete yarn-carriers and 2 color striping attachment and has the new combined Sweater Stitch Drop Lock and Tubular Lock. Special Glove Machines. Finger Knitting Machines 3 inches width of needle-bed. Rapid 2-thread Lock stitch Overseamers.

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Successors to PEPPER MANUFACTURING CO.

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ALL KINDS OF

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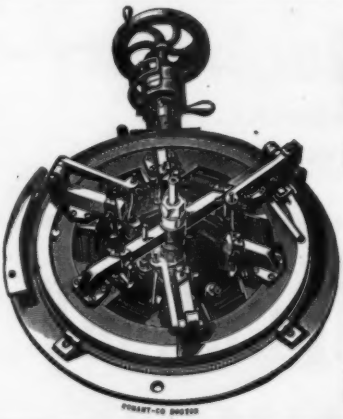
For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins.

CORRESPONDENCE SOLICITED.



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Either plain or full automatic, with stop motion complete, for

RIBBED UNDERWEAR,
SWEATERS,
CARDIGANS,
CUFFS and ANKLETS.

The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

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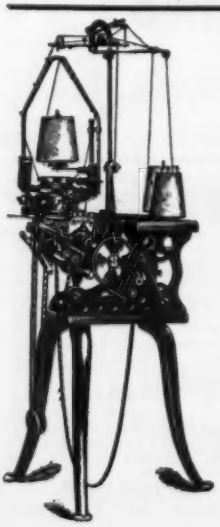

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Two-Feed 7-8 Automatic for Ladies String Work, also Black Legs with White Feet.

Regular 7-8 Automatic for all classes of Cotton Hose. Special 3-4 Automatic for Wool.

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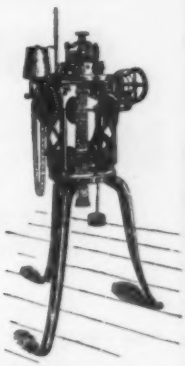
Full Automatic Seamless and Ribbed



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LACINGS For Overshirts and Underwear.

Tipped and Tasseled.

HEPNER & HORWITZ. 30 Howard St. N.Y.

Celebrated Brand PYRAMID TRADE MARK Lacings

For Underwear, Overshirts and Sweaters,

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GERMAN KNITTING MACHINERY

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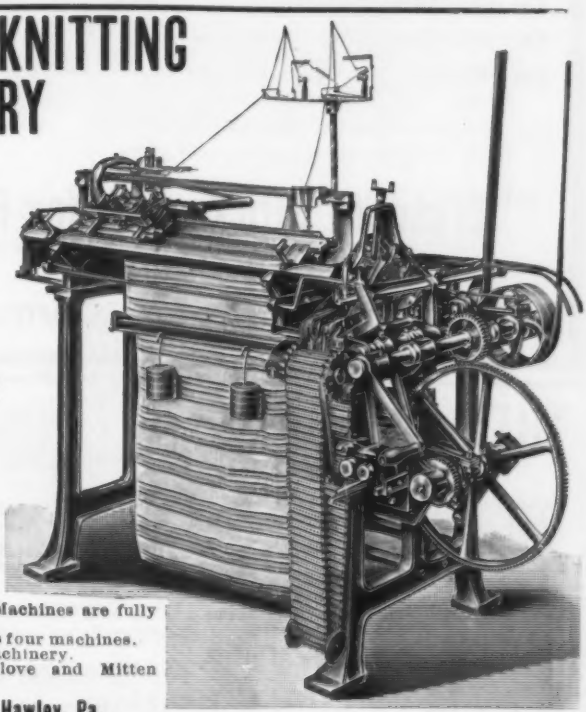
Fancy and Full Fashioned Goods.



Our Specialties are for Machines for Knitting

Sweaters,
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Fancy Vests, etc.

—IN—

Plain, Honeycombed and Other Fancy Stitches.

Our Steam Power Machines are fully Automatic.
One operator attends four machines.
Also Hand Power Machinery.
Also Underwear, Glove and Mitten Machinery.

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The "RECORD"

is the latest improved full automatic knitting machine (combined Cotton and flat) for

FULL FASHIONED HOSIERY

with double heel.

The "RECORD" operates upon an entirely new principle.

The "RECORD" runs 100 turns per minute.

The "Record" produces a fabric with a stitch of absolute regularity.

The "Record" narrows automatically upon a new principle.

The "Record" breaks no needles.

The "Record" finishes the flat circular work with a double heel fashioned on the machine without any hand work before or after.

The "RECORD" turns out a heretofore unknown daily production.

The "RECORD" has needle plates of fine gauges with clock-spring steel ribs, which are removable and exchangeable.

The "RECORD" handles the most tender yarn.

The "RECORD" knits automatically any desired fashioned articles, besides hosiery.

The "RECORD" is built with 2, 4, 6, 8, 10 or 12 heads working together (combined.)

The class of goods made on these machines is in great demand and shows a good profit. Write for further particulars and prices.

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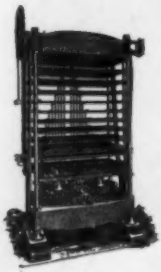

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DOUBLE THREAD,
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Machine,

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Trimmers put on all Makes of Machines.

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THE CHEAPEST AND BEST METHOD

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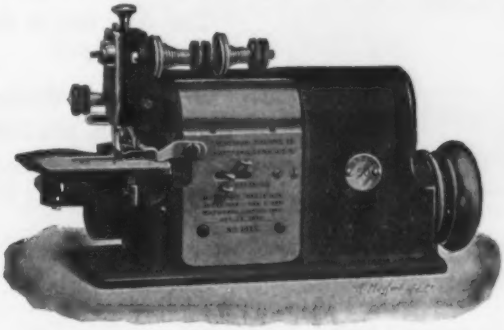
FINISHING RIBBED KNIT GOODS

IS BY THE USE OF

Our High Speed Machines.

Blankets, Skirts or Cotton Goods,

requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.



Send for Catalogue and Samples, stating the kind of goods to be finished.

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WILLCOX & GIBBS SEWING MACH. CO. NEW YORK

Business est. in 1859.

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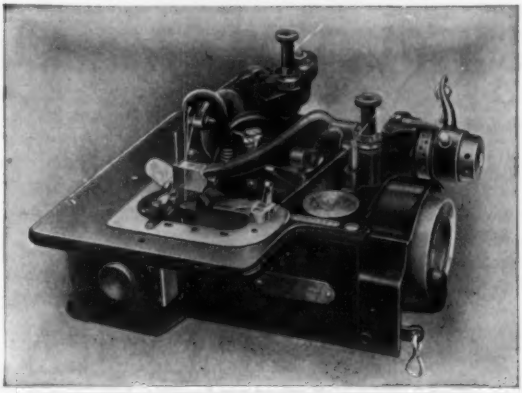
"OVERLOCK" MACHINE.

(TRADE MARK.) (Patent twice upheld by U. S. Court of Appeals.) (Pat. Apr. 5, 1892.)

For TRIMMING, SEAMING, and OVEREDGING (or HEMMING) KNIT UNDERWEAR.

3,000 STITCHES PER MINUTE

12 to 20 STITCHES PER INCH



The "Overlock" Elastic Stitch is equal to the full stretch of the Goods

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THE ARNOLD SEWING MACHINE CO.

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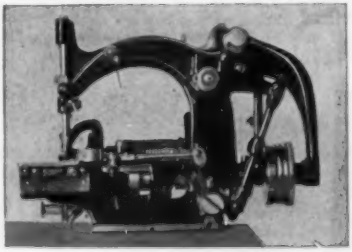

Overedge Welting Machine, with Trimmer.

The very best in the market. (No royalty.)

Overedge Seaming Machine, with Trimmer.

3000 stitches per minute. (No royalty.)

Overedge Sewing Machine, without Trimmer.

For manufacturers of knit goods and other fabrics, with or without trimmers.

Our claims are SIMPLICITY, DURABILITY, ACCESSIBILITY,

Every part of our machine being readily accessible.

This machine has 100 less parts than any other overedge machine.

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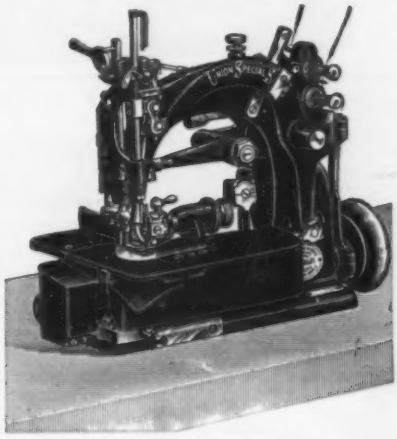
SINGLE "INTERLOCK" MACHINES

(TRADE MARK.)

With Trimmer, for Underwear and Hosiery, Overedging, Hemming and Seaming.

Elastic Seam,
High Speed,
Durable,
Simple,
No Royalty.



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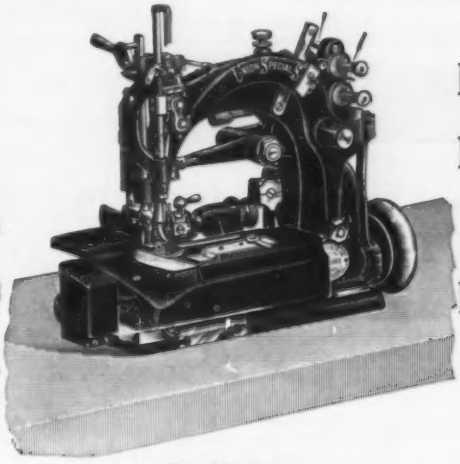
For Underwear.

Special Machine for Hosiery.

Better Work,
Uniform,
Width of Hem,
Only Machine
Having Horn.



More Work,
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For Hosiery.

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BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

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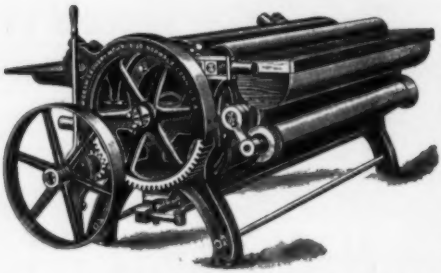
AUTOMATIC IRONING AND PRESSING MACHINE FOR KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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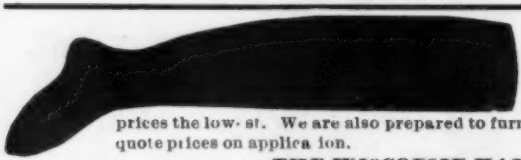

We manufacture all kinds of Hosiery Boards, Dye Boards, also special line of Glove and Mitten Forms. Our boards are of the best, our prices the lowest. We are also prepared to furnish bobbins of all sizes. Can quote prices on application.

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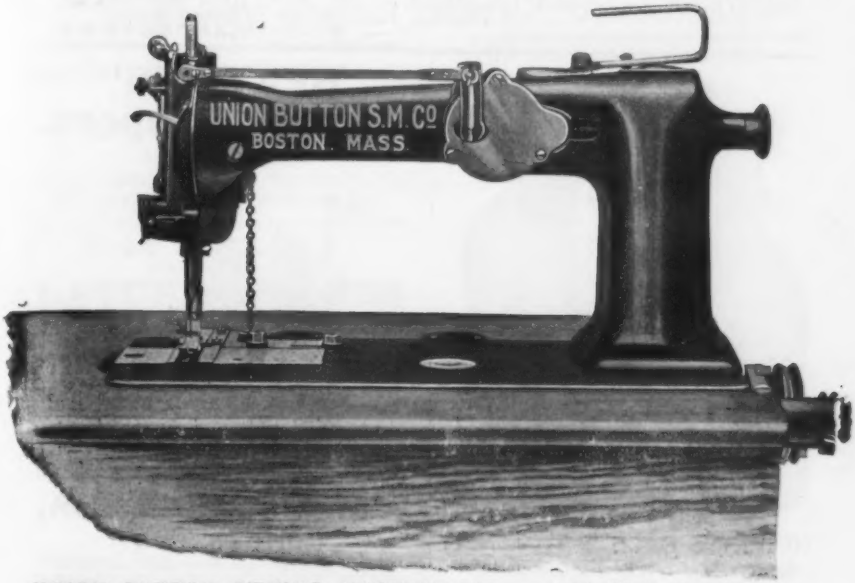
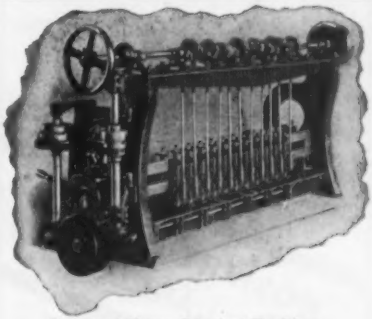
Our New Drawer Strapping Machine

SHOWN BELOW, will sew on straps of any width and thickness, makes either wide or narrow stitching across the straps and will also **BAR** each end of the stitching.



UNION BUTTON SEWING MACHINE CO., 164 High St., Boston.



Standard Horse Blanket Machine.

L. F. FALES,

Manufacturer and Builder of

Multiple Needle Sewing Machines

For Sewing Carpet Linings, Horse Blankets, Wadding, etc.

These machines can be built with any required number of needles.

SPECIAL MACHINERY DESIGNED AND BUILT.

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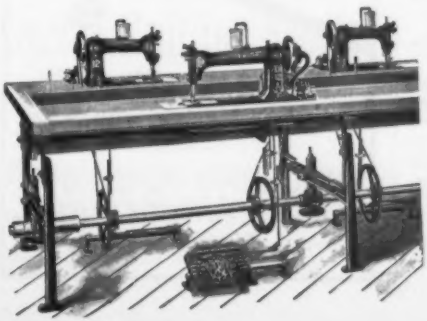

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We Buy Entire Plants of Sewing Machines for SPOT CASH.

If you have anything in our line for Sale, let us make you an offer.

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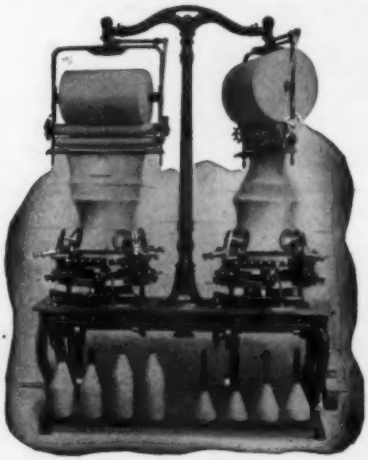
Flat Rib Knitting Machines, 2 to 5 sections, Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Collarette Attachments, etc., etc. All the latest improvements. Sinkers and all Rib Machinery supplies. Patent Springs for Dyeing Boards. Also Ribbed Anklets made to order. Branch Shop, AMSTERDAM, N. Y.



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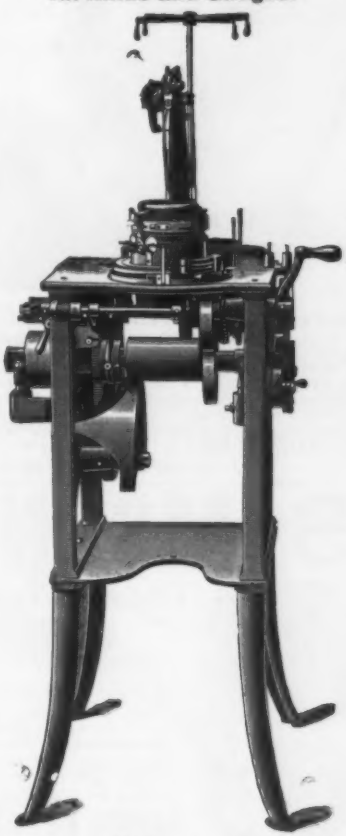

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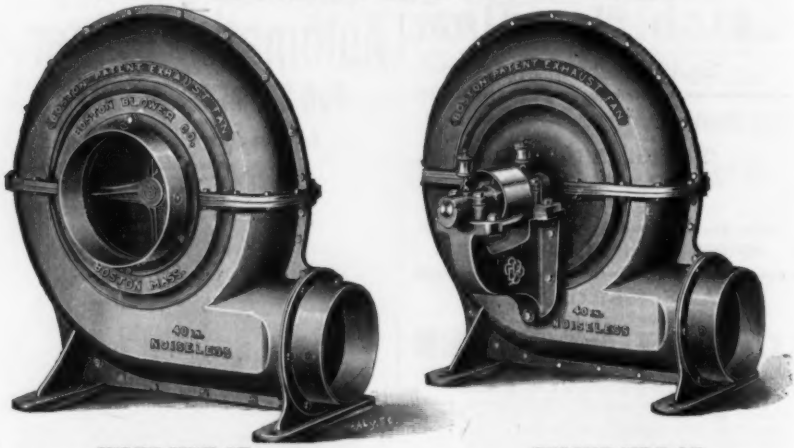

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This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

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For Heads of **3** Feet and Upwards.

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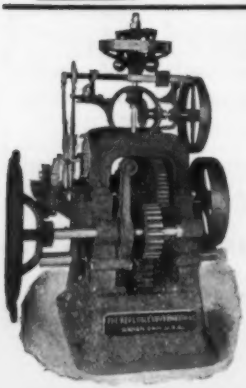

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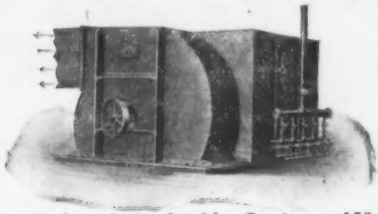

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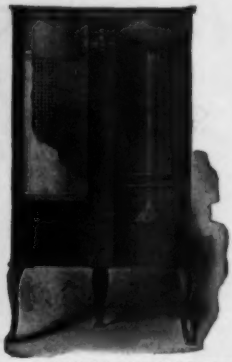

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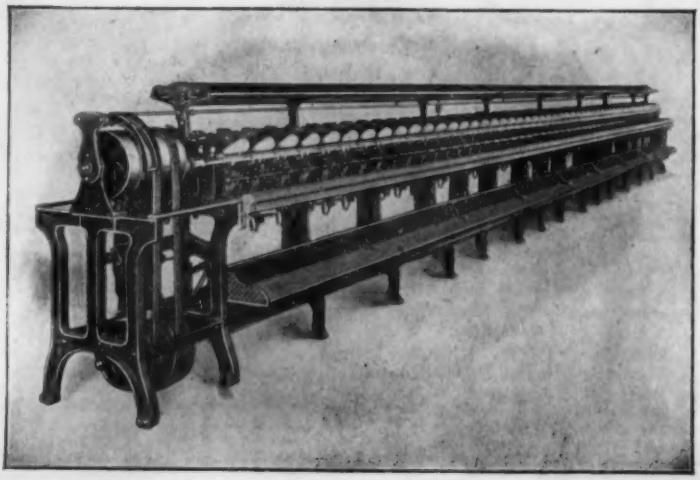

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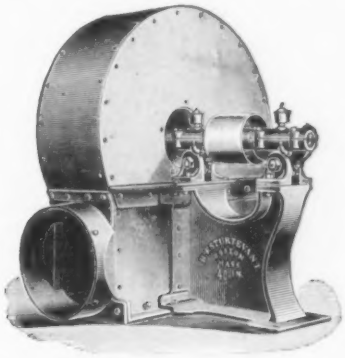

It increases the output and prevents condensation.

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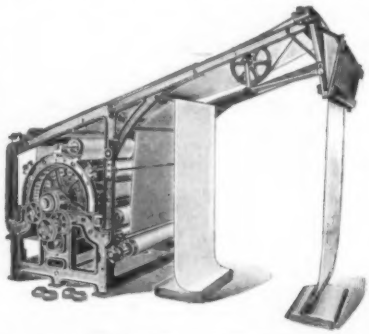

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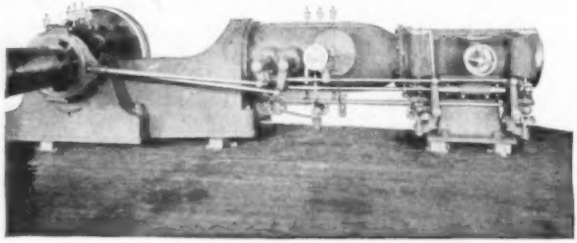

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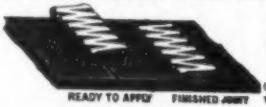

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